Machine and Tool BLUE BOOK

OCTOBER 1955



Ford's Davis

". . . greater demand
for
automatic controls."
Page 149



CONTENTS ON PAGES 5 and 6



These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18"x 18"; and No. 24, Capacity 24" x 24") were basically designed for rapid and economical cut-off of BIG WORK. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to finished, square ends eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—without moving the work.

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Write for Catalog



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COLLET CONTROLLER

low-cost automatic stock-holding for hollow-spindle lathes and other rotating spindle machines.

* never stop the machine

* stock will NOT Slip

* operate manually or automatically

Take a critical look at your methods of loading and holding work. Are they eating into profit margins by robbing you of valuable machine time? The fractions of seconds wasted while stock is positioned, while collets and holding fixtures are set and reset, total up to an alarming theft of productivity.

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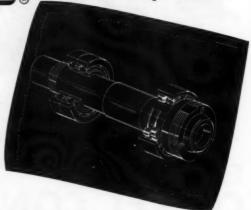
The Bellows Co.

CONTROLLED-AIR-POWER FOR FASIER, SAFER, BETTER PRODUCTION

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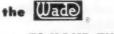
the Wade LATHE spindle

* BEARINGS To assure continued production within close precision tolerances SKF Double row cylindrical roller bearings are used for maximum radial rigidity and the matched angular contact bearing insure adequate thrust capacity. Because of this bearing construction, the Lathe is guaranteed to turn true and round within .0002".

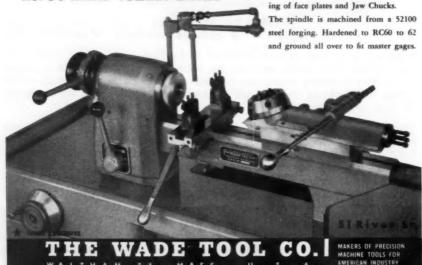


SPINDLE NOSE The Spindle nose is an American Stand-

ard A2-3" with the added exclusive Wade thread-lock feature. This provides fast, effective clamping and positive driv-



no. 73 HAND TURRET



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FILTER

Your plant produces dust in a surprising number of locations. By collecting it at the source you:

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- Protect costly machines
- Reduce cleaning and painting costs

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Doubtless you are daily using ARMSTRONG TOOL HOLDERS that have been in continuous operation for many years. This is sound practice, for this means added profits without added tool costs. But to become complacent, so satisfied that you forget your ARMSTRONG TOOL HOLDERS, is unwise. The "Armstrong System" is a growing thing, with new types and sizes of ARMSTRONG TOOL HOLDERS. ERS constantly being developed to more effectively meet new machining conditions, or to take advantage of newly developed cutting materials.

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ARMSTRONG BROS. TOOL CO.

"The Tool Holder People 5200 W. ARMSTRONG AVENUE CHICAGO 30 ILL



MACHINE and TOOL BLUE BOOK

OCTOBER, 1955 - VOL. 50, No. 10

FEATURED IN THIS ISSUE
FEATURED ARTICLES
INTERVIEW
"There is a greater demand than ever before for automatic controls for machinery." An interview with D. J. Davis, Vice-President—
Manufacturing, Ford Motor Co149
TOOL CONTROL SYSTEM Stop Tool Damage, Theft and Hoarding with Tool Control System
ROLLING
How Rolls Do Fast Job of Converting Coiled Strip Into Beaded Panels
CONTOUR INSPECTION "Bouncing Ball" Method of Indication Inspects Irregular Cam Contours
DIAMOND TOOLS Diamond Tools Cut Machining Costs
COOLANTS Coolants and Lubricants Important For Screw Machines
DRILL PRESS Drill Press Automated to Eliminate Manual Lever Pulling

Helical Gear Hobbing Machine Has Oblique Feed, TriLineal Feeding Cycle 220

by C. T. Bower

GEAR HOBBING

SHOP HINTS

Recessing Tool for Turret Lathe168	The Old Tools Are Sometimes Best172
Wire Straightening Device	Shallow Hole Boring174
Hand Spotfacing Tool Saves Setups170	How to Renovate Files174
ID Radius Tools	

MODERN TOOLS IN ACTION

Unusual Turret Lathe Machining	Tube End Annealing182
Device Developed	Tear Test for Titanium Sheet184
Milling Machine Does Work of Three 181	Cast Iron Boring Operation Simplified 186
Automatic Heating Unit Speeds Up	Steel Cutting Carbide Jumps Tool Life186

DEPARTMENTS

News of the Industry224	Mechanics Through the Ages346
Free Literature	Products Index
What's New in Metalworking273	Index to Advertisers354
The Market Place 345	

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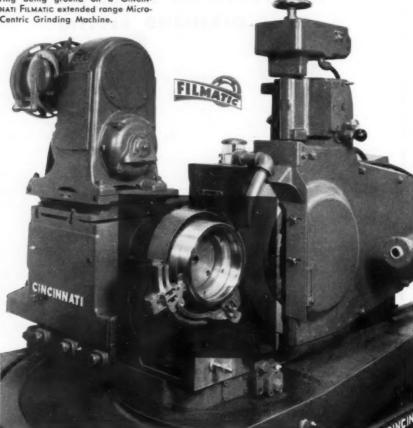
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get a High Quality Micro-

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CINCINNATI



SIZE RINGS

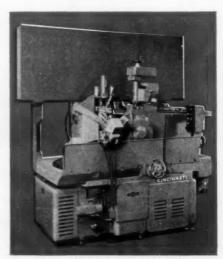
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CINCINNATI 9, OHIO



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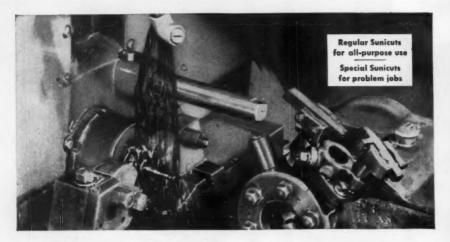
Gisholt Balancers provide plane separation by means of electrical networks. They enable you to use whatever correction planes are most convenient on your specific parts. They are capable of measuring vibratory movement of at least .000025 inch. Gisholts are faster, easier to operate, easier to read.

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MACHINE and TOOL BLUE BOOK

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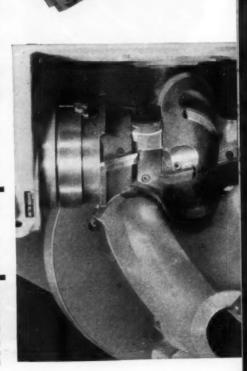
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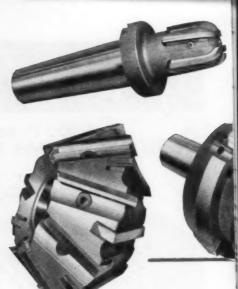
October, 1955

Encircle No. 212 on Card, Opposite Page 65

15

n One Pass Operations Economy Multiple





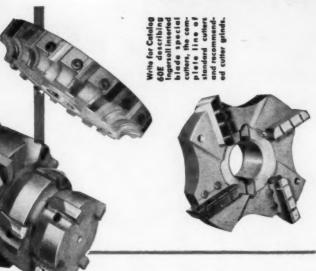


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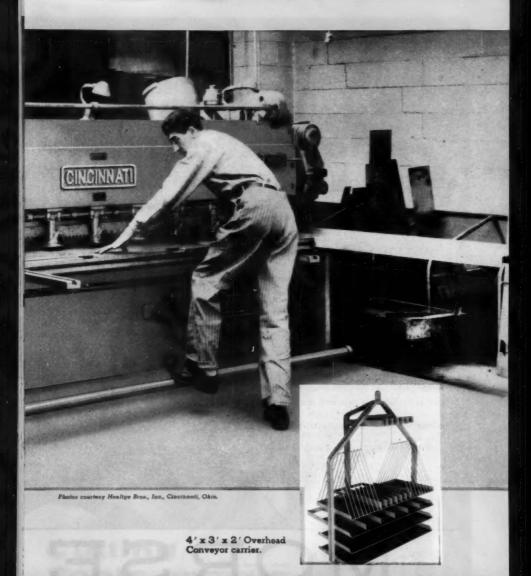
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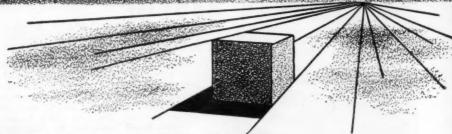
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SUPERIOR

STEEL PRODUCTS CORP.

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MACHINE and TOOL BLUE BOOK



OLIVER ACE Universal Tool and Cutter Grinders

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Priced to meet your budget, the ACE excels for grinding face mills up to 15"-also, slab mills . slitting saws . dovetail cutters . angular cutters · double angle cutters · Fellows helical cutters · reamers taper reamers
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2 MODELS: Standard and Heavy Duty (illustrated) Write Today for Complete Data See our catalog in Sweet's Directory

OLIVER INSTRUMENT CO. TOOL & CUTTER GRINDERS

1408 E. MAUMEE . ADRIAN, MICHIGAN FACE MILL GRINDER

MACHINE TOOLS by OLIVER include:

AUTOMATIC DRILL GRINDERS TEMPLATE TOOL GRINDERS DIE MAKING MACHI

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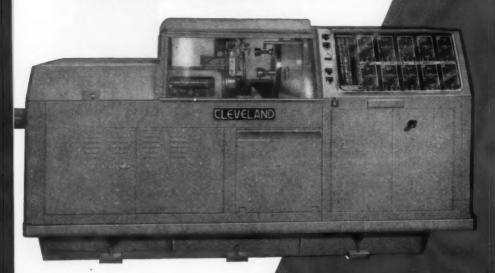
... obsolete all other single spindle automatics of comparable capacities!

Presenting the new 13/8" and 15/8" Model AB

CLEVELAND

DIALMATICS

WITH ELECTRONIC TURRET TOOL FEED DRIVE AND ELECTRONIC INFINITELY VARIABLE SPINDLE SPEED DRIVE





Wine for New "/1%" Model AB

COMPLETELY DIAL CONTROLLED

CONTROL PANEL DIALS enable you to pre-select highly accurate and infinitely variable forward and reverse spindle speeds and forward and return tool feeds for each of five turret positions. Each tool is completely and individually controlled throughout the cycle. Each control is not bound to any preceding or succeeding control in any way. There are no turret feed cams—no change gears. You simply set the dials to obtain the optimum feed and spindle speed for maximum productivity of each working tool!

Again, as for 64 years, Cleveland sets the pace in single spindle bar automatic design!

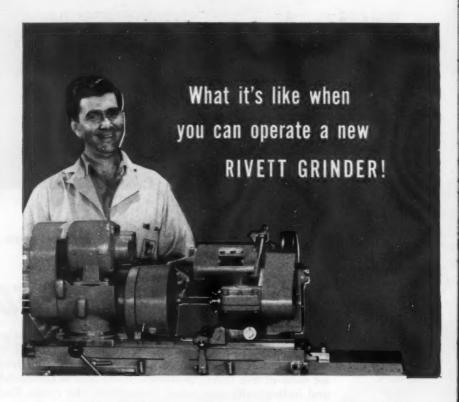
Many revolutionary features—each speeding set-up time, increasing productivity, lowering costs—are incorporated into these outstanding new Clevelands. Write direct today, or call in the Cleveland sales engineer in your area for full details.

THE CLEVELAND AUTOMATIC MACHINE COMPANY

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facturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines



a big smile for operators — a big smile for management because both benefit by-

- 1. Greater output
- 2. Closer tolerances
- 3. Reduced set-up time 4. Minimum rejects

Get proof of greater productivity with Rivett Internal Grinders Write for Catalogs and prices today showing Model 84 with 3" capacity and Model 1024 with 9" capacity



A symbol of accuracy in machine tools.



LATHE & GRINDER, INC. Dept. MTR10, Brighton 35, Boston, Mass.

Encircle No. 225 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

AMAZING PRODUCTION COSTS SAVINGS IMMEDIATELY



FILTER LUBRICATOR RECOMMENDED

> FOR Drilling Tapping Reaming Spinning Spot Facing Fly Cutting Skip Drilling **Counter Boring** Etc.

DRILL FEED



Mechanic.

Air Operated-Hydraulic Control or Solenoid Operation-Optional.

Drill Breakage Practically Eliminated at Break Thru. Top Life More Than Tripled In Many Instances.

Simple Precise Dial Controls Allow Unskilled Operators To Make Rapid Accurate Set Up.

Foot Control Eliminates Fatigue—Permits Operator To Control More Than One Unit At The Same Time.

Operates in any plane. Has numerous other applications.

ORDER MULTI-FEED

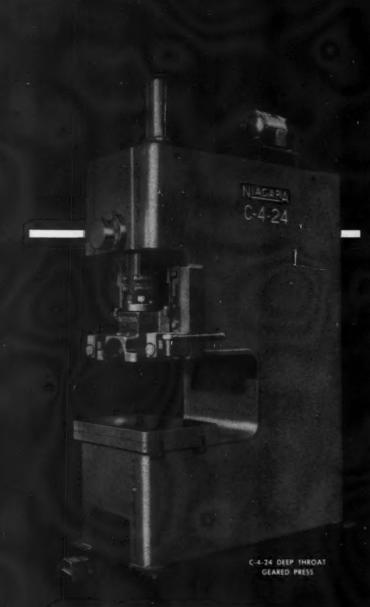
For Fatigueless More Accurate Drill Press Production With Less Effort. Specify make and model of your drill press. Dealer Inquiries Invited

Manufactured Exclusively by

GENERAL PACIFIC CORP.

WASHINGTON BOULEVARD ANGELES 21. CALIFORNIA

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Air counterbalance offsets weight of slide, die and connections.

No overhanging motor, belts, flywheel, brake, shafts nor other mechanisms.

Front-ta-back crankshaft (heavy, forged, high carbon steel) enables fully stylelined, enclosed construction.

Multiple V-Gibs assure maximum die life.

Unusually long slide and stiff channel section eliminate deflection of guiding ways, increasing die life. (J.I.C. flanged slides available.)

Large range of throat depths accommodates tremendous variety of work.

Rugged, all-steel, box type frames stress relieved in a furnace and grit blasted before machining.

Foot switch optionally available for clutch control.

Readily equipped with pneumatic die cushions for drawing operations.

Exclusive electro-pneumatic clutch on all geared models. Famous mechanical sleeve clutch on all plain, nongeared models.

STYLELINE DEEP THROAT PRESSES

KEW



FRONT-TO-BACK CRA

embraces numerous operating and structural improvements

Of far reaching importance, the development of Niagara's impressive, new Styleline Deep Throat Presses has opened the way to numerous operating and structural advantages. Barriers imposed by conventional side-to-side crankshaft arrangements and outmoded end wheel designs have been shattered. The Niagara-developed front-toback crankshaft design introduces a new concept of deep throat press performance and economics:

MODERN, SPACE-SAVING ENCLOSED CONSTRUCTION

The entire driving mechanism is within the limits of a compact, all-steel frame. There are no exposed, overhanging parts and mechanisms to obstruct crane service, block light, throw grease and consume floor space unnecessarily.

LONGER DIE LIFE, GREATER ACCURACY

Increased distance between gibs makes possible a wider slide (left to right) for greater support to wide dies. Longer gibs assure accuracy for the full stroke.

MINIMIZED SHAFT DEFLECTION AND GEAR WEAR

With all gears located inside the press frame and overhung bearings eliminated, damaging shaft deflection is held to a new minimum. Both pinion and gear are more rigidly supported to withstand maximum loading with minimum wear.

PROLONGED GEAR AND CLUTCH LIFE

Gears and clutch members, all neatly housed in the crown, operate in sealed baths of oil to assure longer service life.

Built in a large range of sizes and throat depths, these modern, Styleline Series C Presses reflect the latest thinking of Niagara engineers ... today as always, pace-setters in power press advancement.

HERE'S THE WHOLE STORY ON WHAT THESE MACHINES CAN DO FOR YOU

Get all of the facts. Check the specs! Write for new, illustrated Bulletin 61 today. It will be mailed promptly without obliga-

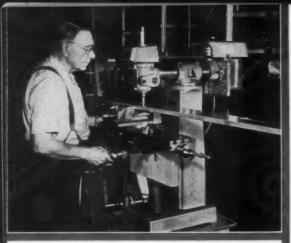


NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N.Y. DISTRICT OFFICES: Buffelo • Cleveland • Detroit • New York • Philadelphia Dealers in principal U. S. cities and major foreign countries



America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

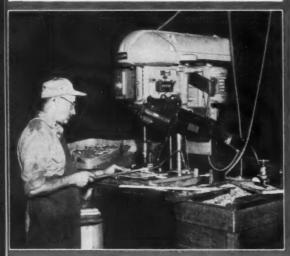
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In the Valley Metal special shop, operators and foremen are agreed that for ease of satup and operation, versatility and accuracy, the CLAUSING Vertical Mill has ne equal. On general milling operations, they say, it turns out more work, with greater accuracy, at lower cost. They find it especially valuable in short-run, custom work.

VALLEY

A subsidiary of Mueller Brass Co. and makers of the famous Vampco Lifelong Aluminum Windows, Valley Metal Products Company of Plainwell, Mich. maintains an elaborate custom shop where new products... the unusual, ornate, and even fantastic in window design and construction... are turned out in an endless flow every day. In this shop where America's most advanced aluminum windows are made, CLAUSING mills and power feed drill presses provide the requisite versatility and accuracy for precision production.



Because of their heavier construction, CLAUSING power feed drill presses are acclaimed the best producers in the Valley Metal Plant. For example, equipped with air feed, machining production was increased 22% over other drills identically equipped. The job involves a 1" diameter spot facing that must be held to close tolerances.

PLUS VALUE PRECISION
MACHINE TOOLS



CLAUSING VERTICAL MILL — a precision machine designed for jig, die and figure making . . . pattern, experimental and tool room . . . and general production milling. Many new, exclusive features. Greater versatility, new ease of setup and operation.

CLAUSING

METAL cuts costs-

IMPROVES ACCURACY WITH CLAUSING

Because CLAUSING mills, drill presses, and lathes are engineered to the most exacting tolerances, they deliver precision performance that exceeds accepted standards.

In small shops and giant industries CLAUS-ING machines are daily proving that they lead in accuracy, versatility, convenience, safety, and economy in experimental, shortrun, and regular production.

CLAUSING machines incorporate several design superiorities that are worth careful study. Each machine must meet exacting tolerance limits before it leaves the factory. Individual test reports covering precision tolerance limits will gladly be supplied upon request.

Before you invest in new mills, drill presses, or lathes investigate the basic design and construction superiorities that have earned world-wide preference for CLAUSING machines. Write for catalog today!



CLAUSING 12" LATHES . . . with features that assure the maximum in accuracy, ease of operation, and dependable performance under heaviest loads. We'll be happy to send you specific data which will enable you to make your own comparison of lathe value.

CLAUSING 18" POWER FEED DRILL PRESSES — 1" capacity in cast iron, ¾" in steel. Four ball bearing drive, with 3 sealed-for-life and 1 double-row, double shielded ball bearings. Vernier depth stop. With heavy-duty GEAR-DRIVEN power feed, the greatest CLAUSING drill press ever.

DIVISION atlas Press. Co.



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F & D Tools maintain the exacting standards of quality necessary to guarantee the most consistent cutting tools ever made. Our "Step Tooth" design assures you the most versatile tool available today. Write today for the address of your local distributor and our latest catalog.

FOR DISTRIBUTOR AREAS STILL OPEN PLEASE CONTACT



TOOL CO., INC.

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MACHINE and TOOL BLUE BOOK

ENGINEERS

STEEL SQUARES

PRECISION GROUND No. 400 SQUARE DIMENSIONS

Size	Thick- ness of Stock	Width of Stock	Length of Stock	Thick- ness of Blade	Width of Blade	Length of Blade inside Stock	Total Length of Blade		
in.	in.	in.	in.	in.	in.	in.	in.		
2 3 4 5 6 8 10 12 18 24 30 36 42	5/16 3/8 3/8 7/16 1/2 5/8 3/4 7/8 1 1-1/4 1-3/4 1-3/4	5/8 3/4 3/4 7/8 1 1-1/4 1-1/2 1-3/4 2-1/2 2-1/2 3-1/2 3-1/2	1-7/8 2-1/2 3 3-1/2 4 5 6 7 10 13 15 18 21	1/16 1/16 1/16 1/16 1/16 3/32 5/32 5/32 3/16 3/16 3/16	5/8 3/4 3/4 7/8 1-1/4 1-1/2 1-3/4 2-1/2 2-1/2 3-1/2	2-1/4 3-1/4 4-1/4 5-1/4 6-1/4 8-1/4 12-1/4 12-1/2 27 32-1/2 38-1/2	2-7/8 4 5 6-1/8 7-1/4 9-1/2 11-3/4 14 20-3/4 24 30 36 42		
9	3/4	1-7/16	5-1/2	1/8	1-1/2	9-1/4	10-3/4		

Also: A

Moore & Wright

DeWitt

Size	Price		
2"	\$3.00	10"	7.00
3"	3.50		
4"	4.00	18"	30.00
5"	4.50		
6"	5.00		50.00
	6.00	36"	75.00
0"	6.5		95.00



Up to 12" each square is supplied in a strong wooden box. Larger than 12" squares are supplied in strong wooden sheaths.

These Squares have been introduced to meet the demand for accurate tools for use by the engineer on production work. The square blades are hardened and tempered. As a Square of this accuracy is a delicate instrument, each one is packed in a separate wood box, and we believe that this will be appreciated by those engineers who take pride in their tools.

EQUIPMENT CORP.

188-190 Elizabeth Avenue NEWARK 8, NEW JERSEY

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You can be certain ... if it's "RFC"

Maintains original setting regard-

less of use or wear. No ratchets or pawls to wear down and "throw off" feed spacing. Models to fit all presses.

WRITE FOR LITERATURE

PRESSES"

Jing. All attach.
nished, including nkage.
spring from one
four points of contact

ROLL FEEDS CORPORATION
ASHTON, R. I.

"MANUFACTURERS OF QUALITY FEEDS FOR POWER PRESSES"



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MACHINE and TOOL BLUE BOOK



SMOOTHER HOLES . . . It's the *chips* that score up the hole surface. You need polished flute drills to get those chips out.

NEW YORK drills are ground from the solid to a 15 to 20 micro-inch finish and accurately pointed on machines of our own design. These ultra-smooth flutes improve drilling of heat-hardened aluminum, titanium, magnesium and other non-ferrous metals.

NEW YORK drills are made to last longer, give you greater production. You get more holes, all perfectly round, exactly on size, without burrs. That's why so many of industry's largest and most discriminating users specify NEW YORK!

Write now for catalog, technical manual and net prices.

NEW YORK TWIST DRILL COMPANY, INC.

MAIN PLANT IN WESTRURY L I NEW YORK

EASTERN HEADQUARTERS: 278 LAFAYETTE STREET, NEW YORK 12, N. Y. MIDWESTERN HEADQUARTERS: 30-A NORTH CLINTON STREET, CHICAGO 6, ILL.

Consider What YOU Will Save

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CARBIDE GAGES





. . . "a lone \$38 carbide gage saves us \$4000.00 a year"—"we cut gage checking expenses \$20,000 annually with carbide gages"—"our initial gage costs were reduced \$1,280.00 in nine months on a single part inspection."

These are statements backed by actual records of Lincoln Park customers. And they are not unusual—for throughout industry similar reductions in inspection costs have been and are being effected by the use of Lincoln Park carbide gages. Savings in gage replacement . . . less gage checking . . . more parts passed because of closer gaging tolerances . . . all are factors contributing to these lower costs.

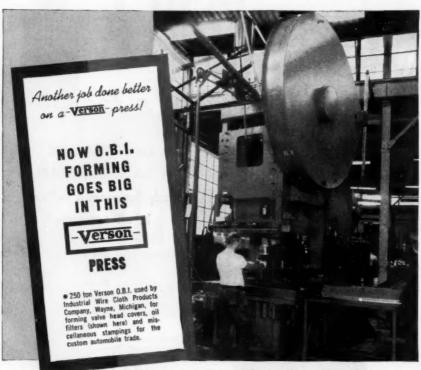
Take a look at your gage applications and see what you might save by using carbide gages. Then call on Lincoln Park—the company that pioneered the use of carbides in gage manufacture—to meet your needs exactly!

Pacala

Sincoln Fark

INDUSTRIES, INC.

LINCOLN PARK 25. MICHIGAN





Catalog OB-54 gives Verson O.B.I. specifications and design details. Write for your copy. Economy, convenience and versatility—these are the reasons for the expanding use of Verson Open Back Inclinable Presses, even on big capacity jobs like the one illustrated.

In Verson O.B.I.'s you get design and construction features normally associated with large, costly specialized machines . . . and you get the liberal slide and bed area, stroke length and depth of throat that assures their adaptability to jobs well beyond ordinary ideas of the O.B.I.'s limits.

Verson O.B.I.'s are available in capacities ranging from 90 to 250 tons in standard and special types. Let us go over your requirements with you and show you how Verson O.B.I. Presses can help you to lower costs.

A Verson Press for every job from 60 tons up.



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VERSON ALLSTEEL PRESS CO.

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MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES
TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES
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October, 1955



32-ton

43-ton

56-ton

in all tonnages

70-ton 88-ton

IIO-ton

FERRACUTE

Write or wire for complete list of presses available

FERRACUTE MACHINE COMPANY

Since 1863 Manufacturers of Power Presses, Press Brakes and Special Machinery

BRIDGETON, NEW JERSEY, U. S. A.

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MACHINE and TOOL BLUE BOOK

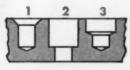
A NEW CONCEPT!

Size-Optional

SUBOLAND

Believing that there is too great a void between standard and special tooling, Mohawk has designed and developed a semi-standard subland tool.

The Mohawk Size-Optional Subland is machined, hardened and placed in a stock bin. This results in a material saving to the customer in set-up costs, reduces delivery time to a fraction of that usually required for special tools, and allows a tremendous reduction in inventory. In ordering these Size-Optional Sublands, the customer is limited only in relation to shank specifications, and partially on overall length requirements. Diameters and step lengths are completely optional to fit the particular application. Write for full details.



SUBLAKO DRILL (2-2)

- (1) Drill—Chamfer (2) Drill—Counterbore
- (3) Drill-Drill

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NORMAL DELIVERY

1 WEEK
FROM RECEIPT OF ORDER

Mohank

910 E. MAIN ST. MONTPELIER, ONIO

worlds largest producer of Sublands

THA SHIES WASHI

THE WALES EXHIBIT SEE IT IN ACTION AT



won you now STIMM POTTS, WALES Tooling and production. They to the men of WALES. They Bulldain Banching, notching and nibbling THE WALES WAY to sove days and dollars.



WALES-STRIPPIT CORPORATION

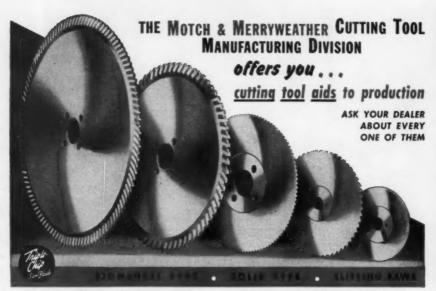
George F. Wales, Chairman 6 Payne Avenue. North Tonawanda. N.

596 Payne Avenue, North Tonawanda, N. Y. (Between Buffalo and Niagara Falls)

WALES-STRIPPIT OF CANADA LTD., HAMILTON, ONTARIO

Notching Equipment

Specialists in Punching and



 Get the full story on Motch & Merryweather's complete line of saw blades and slitting-slotting saws — a type, size, and thickness for every purpose. Triple-Chip cut-off blades up to 108" diameter down to slitting saws 3" in diameter — special saws — for any machinable material, ferrous or non-ferrous, any size, any shape, any thickness. Ask how the M & M Triple-Chip Method reduces tooth strains, prolongs blade life and speeds production with accuracy.

TRIPLE C® GRINDING COOLANT

Triple C[®] grinding coolant makes for improved results and lower costs on all wet grinding. Transparent, stable solutions; maximum cooling; grinding wheels stay clean and free-cutting.

TRIPLE-CHIP HEAVY DUTY ANTI-WELD SOLUBLE OIL

M & M Heavy Duty Anti-Weld Soluble Oil lengthens tool life, especially under severe conditions. Deters "pickup", cuts rejects, is oily (not greasy), odorless; lowers production costs.

THE MOTCH & MERRYWEATHER MACHINERY CO.

Cutting Tool Manufacturing Division
1250 EAST 222nd STREET, CLEVELAND 17, OHIO



O-O-O-OH! WHAT YOU MISSED ... if you didn't get to see these

PRECISION PRODUCTS

at the Machine Tool Show!

EXHIBIT A

The NEW POPE SUPER-PRECISION BORING MACHINE

that bores holes round within millionths of an inchtable actuation all electrically controlled — feed and traverse rates infinitely variable — automatic cycle, including loading if desired - angled table and bridge for extreme ease of loading and unloading.



EXHIBIT B



POPE 1 HP, TOTALLY ENCLOSED 3600 RPM MOTORIZED, CARTRIDGE TYPE PRECISION SPINDLES

with double row cylindrical roller bearings and separate thrust bearings for no endwise movement of the shaft

EXHIBIT D



POPE

HEAVY DUTY, % TO 100 HP DIRECT MOTORIZED SFINDLES

for Horizontal or Vertical Skin Milling, Grinding, Milling, Boring and Other Operations

POPE SUPER-PRECISION

MOTORIZED TOOL AND CUTTER GRINDER SPINDLES

EXHIBIT

EXHIBIT



POPE HEAVY DUTY VEE-BELT DRIVEN, PRECISION MILLING SPINDLES.

and Wheel Heads, 1/2 to 50 HP EXHIBIT G



GRINDING SPINDLES for Cincinnati, Norton, Landis and Heald Grinders and Springfield Vertical Grinders

EXHIBIT



POPE SUPER-PRECISION HIGH FREQUENCY HEAVY DUTY GRINDING AND MILLING SPINDLES

for speeds up to 100,000 RPM No. 105

EXHIBIT



POPE HIGH SPEED VERTICAL OR HORIZONTAL ATTACHMENTS

for 6" x 18" surface grinders at 15,000 RPM

with clearance Angle Swivel-ing Heads for Angular Adjust-ment In A Vertical Plane

Specify

WRITE FOR COMPLETE SPECIFICATIONS, PRICE AND DELIVERY

POPE MACHINERY CORPORATION

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ABSORPTION

is amazing . . .

"Perf-Embossed"® texture gives Scott Wipers their dirt-gripping, oil-drinking power

See our National Metal Show demonstration at Philadelphia's CONVENTION HALL

Booth 915 October 17-21

wiping cost you last month?

Switch to Scott Wipers—eliminate expensive handling, controls and lost production time... get more efficiency!

Add up your wiping costs for last month. What did you spend to count, sort, bale and launder wiping material? How much efficiency did you lose in distribution . . . in housekeeping . . . in production time?

New Scott Wipers—the strong, capable disposable wipers—put an end to all these inefficiencies, all these high-cost "extras." But try the Scott Wiper yourself. Ask your local Scott salesman or distributor to help you set up a 90-day trial installation in your plant.

Or mail this coupon today.

DISTRIBUTION is simple . . . The Dispenser-box is a portable supply of 125 wipers SCOTT PAPER COMPANY Dept. MT-E, Chester, Pa. Please send me full information on Scott Industrial Wipers. Name Company Address City

MORRIS AIR-OIL-MATIC DRILL UNITS



Fast, low-cost production for drilling and allied

- ADJUSTABLE FEED
- WIDE RANGE OF SPINDLE SPEEDS
 - HYDRAULICALLY CONTROLLED CONVENIENT CONTROLS

Available for use on Special Purpose Machines like the MORRIS High Production Machines

MORRIS CAM-MATIC DRILL UNITS



MATIC Drill Units electrically con-MORRIS CAMprovide automatic, rolled. mechanically driven drilling. tapping and allied operations . . . with dependability and built-in accuracy,

convenience. Specially-featured electric clutch provides automatic thrust control and dull or broken drill detection.



for Production PLUS Precision

MORRIS Machine Tools. For more than 40 years, MORRIS has designed and manuactured high speed, precision equipment. The new models displayed on these two pages are the latest in a series of machine tools that have won the favor of the nation's leading N.E.W. .. with proven performance, that's the story of these up-to-the-minute models of

Your built-in benefit with these new MORRIS Mor-Speed Machine Tools is precise work at high speeds. Make your own comparison of MORRIS features with those of any unit. You'll see why the leaders demand MORRIS!



MORRIS HIGH PRODUCTION MACHINES Special Operations with STANDARD Units

You can have swift, accurate production on multiple operations like drilling, reaming and tapping with MORRIS Mor-Speed High Production Machines. They provide special operations using standard units, with completely automatic operation. Easy re-alignment speeds model changeovers.



MORRIS MOR-SPEED RADIAL DRILLS 4 Sizes—2 New Units Centralized Centrals A complete line of heavy and light production radial drills feature centralized controls for ease of operation, fast production. Two new models utilize hydraulic control for pushbutton operation and pre-selected seeds and speeds...the easiest, fastest operation ever available.

MORRIS MOR-SPEED MACHINE TOOLS have been selected by the world's leading manufacturers for low-cost mass production of precision-made parts and assemblies. Complete case history data is evallable FREE upon request.

Write today for catalogs concerning specific machines, If you prefer, outling your production problem. MORRIS en gineers will make recommendations to its best solution.



Morais

THE MORRIS MACHINE TOOL COMPANY 837 HARRIET STREET CINCINNATI 3, OHIO, U.S.A.

ARTER

FAMILY OF GRINDERS



MODEL E -- 12" AND 16" ROTARY SURFACE GRINDER

A GENERATION of experience stands behind the ARTER family of grinding machines. Progressively these machines have attained advanced techniques, simplification of grinding processes, closer tolerances. Today ARTER is proud of the family especially the newest members, Models E and F Rotary Surface Grinders.

MODEL F 12" ROTARY SURFACE GRINDER





MODEL 200 CARBIDE TOOL GRINDER





WORCESTER . MASSACHUSETTS

Agents in industrial centers of United States and Canada

You Can Always Beat Higher Machining Costs With

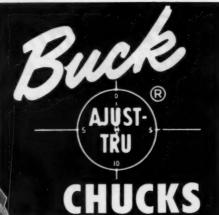


Nothing Like It!

Others try—but unsuccessfully—to provide Buck Ajust-Tru features. The Buck was the first and is still the only practical precision scroll chuck. Make your own comparisons.

6-3-2 JAWS

Whatever your chucking needs on lathes, grinders, dividing heads, and screw machines there's a Buck chuck to handle them up to 9" diameter.



- Get dead true precision in one minute, without shims.
- Get .0005" precision, chucking duplicate parts, without further adjustment.
- Handle collet work without collets.
- End most needs for stub arbors, mandrels, special fixtures.
- Save time ordinarily spent changing from scroll chucks to independent chucks for precision work.

You get all those time saving advantages with Buck chucks plus longer accuracy and longer wear—at conventional chuck prices! Send for catalog with complete details.

BUCK TOOL COMPANY

1012 SCHIPPERS LANE . KALAMAZOO, MICH.

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The Keynote of

BOKUM

RAPIDOR TURNING TOOLS for cutting off and threading





high speed steel blade Car

Carbide-tipped blade

High speed steel blade



Style CO

Style TH-S

In a recent advertisement, we described the features of Bokum Rapidor turning tools for roughing, semi-finishing and finishing. Here is the remainder of the Rapidor line: tools for external grooving, cutting off and threading.

They feature interchangeable blades—a fact which guarantees extra-long tool life. The unique design of the clamping of the blade and holder makes the tool rigid, eliminates chatter.

Other applications of Rapidor tools feature cutters for turning forms on the shoulders of a shaft, and radius tracer tools. Angular chip breakers, designed to remove chips away from the operator, can be furnished.



BOKUM TOOL CO.

14775 Wildemere Ave., Detroit 38, Mich.

Write today for Catalog 454 for a complete description of Rapidor Tools.

- I Long tool life; blades only need be replaced.
- 2 One holder for all lathe operations; high speed steel and carbide-tipped blades available.
- 3 Cutting, clearance angles are built into the cutter; constant clearance throughout life of tool.
- 4 Shape of cross section remains constant.
- 5 Resharpen top face only.
- 6 No set-up problems.
- 7 Rigid, large chip removal cool cutting action.



other method, it will pay you to know the many advantages that CAMPBELL abrasive cutting can bring.

LOW COST FACTOR When cutting sections abrasively from bar lengths for forging, the metal may be purchased "unannealed." In some cases, saving the annealing cost will more than pay for cutting. Smooth cutting of abrasive process saves cost of smoothing operations. Accuracy of abrasive method reduces scrap loss.

HIGH QUALITY FACTOR High quality control standards are usually maintained by laboratory testing of specimen cuts. With abrasive cutting, metal can be cut in practically any condition—soft, hard, annealed or unannealed—with cut-off pieces ready for deep etching.

• Find out TODAY what the CAMPBELL methods can do for you. Testing procedure by CAMPBELL engineers will show conclusively whether abrasive cutting machines will save YOU money.



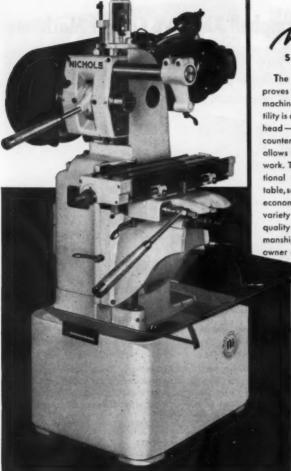
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Campbell Machine Division

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Nichols Miller STANDARD MODEL

The Standard Nichols Miller often proves to be the handiest (and busiest) machine in the shop. Its unusual versatility is due to the "rise and fall" spindle head—the spindle being mounted in a counter-balanced sliding head which allows the cutter to be brought to the work. This unique feature, plus conventional screw or lever movements of table, saddle and knee, guarantees fast, economical production on the widest variety of parts. And the unexcelled quality of Nichols' design and workmanship commands the respect of every owner and operator.

"the miller that uses its head!"

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Table Working Surface 48" x 21" or 30"
Longitudinal Travel 70" or 19"
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Rise and Fall of Spindle 48"
Selective Speed Ranges up to 5000 R. P. M., Weight 1230 libs.

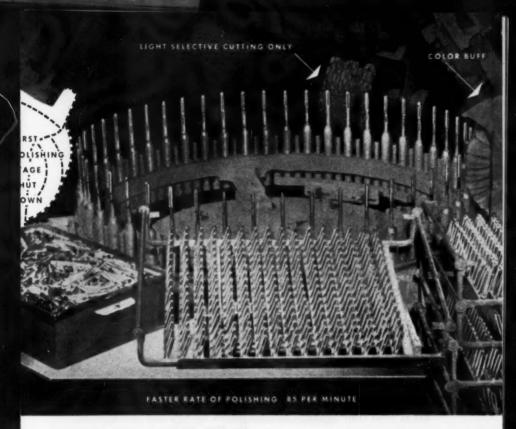
Write today for the Michals general catalog, which describes the six models of Michals Millers. A sound, color marrie, "the Miller that Uses its Head" is available for free showing. May we reserve it for you?



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low Formbrite cuts polishing costs 40% for JARCO



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Formbrite has really paid off. Jarco uses ican Brass Ltd., New Toronto, Ont. 50- and 98-spindle continuous-loop machines having two cutting stages and a final color buff stage. The first cutting stage is shut down completely. The second stage is used for only a partial or selective cut in certain areas of the cap - because of the extremely deep draw. The color buff stage does most of the work. The savings in polishing run about 40%, according to David Roberts, vice president,

Formbrite is a premium product at tance, sounded ideal for Jarco products. a nonpremium price. Find out for Formbrite has proved an excellent yourself how its superfine grain, excelpressroom material. The uniformity of lent drawing properties, strength, and temper from batch to batch eliminated scratch resistance can help you make a shutdowns for adjustments in their better product at lower cost. Write for battery of 12-plunger Waterbury- Publication B-39. Better yet, ask about Farrel presses, which can produce up a sample or a trial batch. Write: The American Brass Company, Waterbury It's in the polishing room where 20, Conn. In Canada: Anaconda Amer-

FINE-GRAIN DRAWING BRASS

The American Brass Company



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- New rapid traverse lever within operating control area.
- Separate drive motor for table, saddle and knee provides more smooth balanced power at the cutter,

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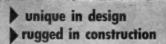
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THE FAMOUS

The three-dimensional bench Model 106 cuts costs — engraves, routs, models and profiles, giving you expert results even by unskilled workers.

The Model D-2 heavy-duty, two dimensional Pantograph is a precision machine with a multitude of new features. Open on three sides, it permits complete freedom for engraving, milling, profiling large panels (up to 30" in diameter) or bulky pieces. Single, micrometer adjustment controls vertical depth of cut, automatically adjusting copy table with pantograph. Range of reduction ratios from 2-to-1 to infinity! Vertical range over 10 inches!

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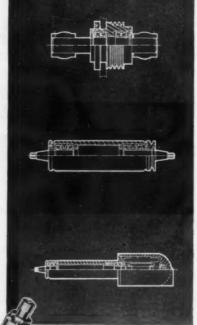
CAMBRIDGE - MASS.

Operators of
Brown & Sharpe
Grinders get production when
modernized with
Whitnon Spindles

Whitnon Spindles are better because they're anti-friction grease lubricated, sealed at assembly, precision balanced on own bearings, completely interchangeable, designed to fit present wheels

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Encircle No. 261 on Card, Opposite Page 65

44

MACHINE and TOOL BLUE BOOK



REAMERS



EXPANSION REAMERS



SHELL-TYPE EXPANSION REAMERS



CARBIDE-TIPPED CIRCULAR TOOLS



CORE DRILLS



STUB SCREW MACHINE REAMERS (SOLID AND EXPANSION TYPESI

Your economy begins - and work quality improves—when you specify Staples carbide-tipped circular tools. They have established an enviable reputation throughout industry for delivering top-profit performance on every job.

A complete range of standard tool designs and sizes is available for quick delivery from stock. For your special tools, submit your specifications and prints for a prompt quotation. You'll be making the most of your standard and special tool investment when you put Staples Tools to work in your production.



SHELL END MILLS

COUNTERBORES. **SPOTFACERS**



Write for the Staples Standard Tool Catalog

CARBIDE-TIPPED CUTTING TOOLS

A complete line of Circular Carbide-Tipped Tools, Expansion Reamers — Special Tools

STAPLES THE TOOL COMPANY, CINCINNATI Encircle No. 262 on Card, Opposite Page 65

October, 1955

67

HOW MANY HOLES BEFORE THIS STEP DRILL HAS TO BE RESHARPENED AGAIN?

100 pieces per sharpening or 200—it all depends on the quality of the sharpening job you do. R-O form relief leaves metal behind the edge to support it and dissipate heat. The edge stands up twice as long, the tool lasts twice as long and production costs drop correspondingly.



Produces radial or axial relief only or any combination of the two on taps, step drills, profile mills, reamers, etc. Operation has been completely simplified. For maximum versatility use with the R-O Grinder.

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ROYAL OAK TOOL & MACHINE CO.

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MACHINE and TOOL BLUE BOOK

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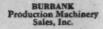
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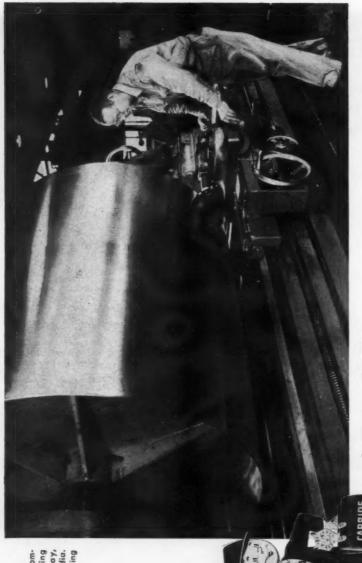
MONTREAL Humphrey B. Walton

For all production, including complex automation, we make the finest circular metalcutting tools-but they cost no more.



PROVIDENCE 5, RHODE ISLAND

Photo, courtesy Commercial Machining Company, Conway, Pa. Turning 60" dia. Pa. Turning coll.



Mr. Tooley Says:

"There's more than one way to skin a cat"

CINCEL C

SUPER HIGH SPEED STEEL

- Operating speeds 25%—50% faster than ordinary high speed steels
- Longer tool life
- Cuts costs by increasing production
- Particularly suitable for cutting tough alloy and stainless steels

FIRTHITE

STANDARD TIPS, TOOLS, INSERTS AND HOLDERS

- Highest metal removal rate
- Uniform, dependable Firthite quality and performance
 - Large stocks of standard tools and tips for
- Mechanically-held and brazed designs

immediate delivery

Yes, in the held of tooling, alternative cutting materials make it possible to utilize the same production equipment for a variety of applications. In typical turning operations either Firth Sterling High Speed Steel or Firthite Sintered Carbide cutting tools may be selected . . . depending upon the characteristics of the metal and the production requirements of the job.

Firth Sterling, manufacturers of complete shop tooling needs, occupies the unique position of providing both steels and carbides to "skin the cat" of production in the most economical and effective ways. Thus, from one dependable source of supply you are assured of (1) completely unbiased tooling recommendations and, (2) the selection of the exactly right carbide or steel or both to provide maximum production!

Both Firth Sterling's famous CIRCLE "C" Super High Speed Steel and FIRTHITE Sintered Carbide cutting tools and tips are used alternatively for most metal removal operations. Write now for literature and unbiased recommendations for your specific needs.

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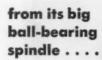
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.... to the precision carriage ...

along its
rugged, accurate bed . . .



to the tailstock .

.... and down to the variable speed drive ...



and its solid, strong, convenient cabinet



... the No. 6560 Logan 14" Lathe is

ruggedly proportioned, precision built and dynamically balanced. Its superiority is evident as it hogs the heavy cuts with almost no perceptible vibration, and pro-

duces precision results in production, maintenance and tool room operations.

At your Logan dealer's.

Write for Bulletin 14-L.



14%" swing over bed 9" swing over saddle 13%" spindle hole 1" collet capacity 40" between centers Variable Speed Drive Ball Bearing Spindle 38 to 1200 rpm

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Chicago-Latrobe

418 WEST ONTARIO STREET • CHICAGO 10
• DRILLS • COUNTERSINKS • CARBIDE TOOLS
• REAMERS • COUNTERBORES • SPECIAL TOOLS

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How is Chicago-Latrobe service?



Your CHICAGO-LATROBE Distributor gives you quickest service at lowest cost. Through him you get technical assistance, too!

ASK FOR CATALOG No. 186

Up to 40% higher tightening torque— tightening torque— a new Unbrako feature

RECOMMENDED SOCKET SET SCREW TIGHTENING TORQUES (Inch-Pounds)

SCREW SIZE	UNBRAKO		c	MINIMUM DIFFERENTIAL %		
#4	5	3.9	3.5	28		
#5	9	7.8	7.4	15		
#6	9	7.8	7.4	15		
#8	20	14.7	14.5	36		
#10	33	26.5	25	25		
1/4	87	62	60	40		
5/16	165	122	125	32		
3/8	290	198	225	29		
7/16	430	309	350	23		
1/2	620	460	500	24		
5/8	1225	1106	1060	11		
3/4	2125	1540	1800	18		
7/8	5000	3660	4600	9		
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ALL UNBRAKOs can withstand higher tightening torques than ordinary set screws. For example, the recommended torque for a 1/4" UNBRAKO is 87 inch-pounds—40% greater than that recommended for an ordinary set screw.

You can set a new High-Torque Unbrako self-locking socket set screw and forget it—it stays tight



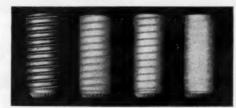
There are several reasons: the deeper socket which gives you much better purchase with the wrench; the

radius in the socket corners which eliminates the sharp corners where cracks start; the special methods of heat treatment in atmospherecontrolled furnaces; the development of fully formed threads.

These microphotographs illustrate just what fully formed threads do for the new High-Torque Unbrako. They make the whole screw stronger. The metal is compressed into the closely knit grain structure that you see. The grain flow follows the contour of the threads. There are no straight lines along which shear can occur. The Unbrako retains its flow lines even when ground down to .010" below root diameter. Screws with cut or ground threads lose thread form at root diameter.

You can't buy another screw as good as an UNBRAKO. See your authorized industrial distributor today. Or write STANDARD PRESSED STEEL Co., Jenkintown 52, Pa.

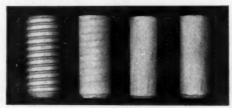
Unbrako Set Screw



Pitch diameter Root diameter .005" below .010" below root diameter root diameter

Fully formed threads make the whole screw stronger. The metal is compressed into a closely knit grain structure. The grain flow follows the contour of the threads. The Unbrako retains its flow lines even when ground down to .010" below root diameter. Screws with cut or ground threads lose thread form at root diameter.

Ordinary Set Screw



Pitch diameter Root diameter .005" below .010" below

STANDARD PRESSED STEEL CO.

UNBRAKO SOCKET SCREW DIVISION SPS

YEA, SUPER's the word...



Note its advantages: 1½ Horsepower Head or optional 2 Horsepower with continuous duty motor gives 50% or MORE CAPACITY than previously available. A LOT MORE RIGIDITY—A LOT MORE ACCURACY. Increased horsepower and dynamically balanced Cast Iron Pulleys and Drive System make possible the improved production capacity. More weight in the column, heavier ribbed column, heavier knee, heavier saddle. Other improved features. Choose the new SUPER 55, the best machine for your BORING, MILLING and DRILLING operations. Write for literature.

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JACKSON, MICHIGAN

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DRILL AND TAP DRIVERS

reduce costs, increase accuracy

Positive holding and driving reduce tap breakage and downtime

Close center and multiple-spindle tapping are facilitated greatly by these Scully-Jones Close Center Tap Drivers and Chucks. Fourway gripping action of the new 4-slot chuck (1) means four times greater holding power on the tap

shank.

Scully-Jones Close Center Tap Drivers and Chucks are designed with small body diameters for working to close centers, near shoulders, and in other inaccessible locations. The tap and driver run true within .002 in. for maximum accuracy in tapping. These tools can replace expensive special length taps or pulley tapping and pay for the changeover quickly. Short, medium, and long projections (2) meet most requirements.

New offset positive drive protects cutting edges of center drills

Scully-Jones Style "B" Center Drill Drivers (3) offer accurate, troublefree center drilling, with positive drive in the flutes of the drill and maximum protection of the cutting edges.

These new "precision holding" tools are available to solve your tapping problems and reduce costs now! Write for Bulletin 1-50.





"Precision Holding" for holding precision

Scully-Jones and Company

1907 S. Rockwell St., Chicago 8, III.

Encircle No. 270 on Card, Opposite Page 65

October, 1955

Designed for awkward, heavy hard-to-handle pressing jobs

With this Dake Movable Frame Press you can move tons of hydraulic power over your work.

> The frame moves lengthwise over the worktable, and the workhead moves laterally along the frame. Thus the ram can be placed anywhere it is needed over the extremely large work area. Heavy, awkward parts can be moved by overhead crane or hoist to the worktable, and the power centered above them.

> The extra large table area gives a greater capacity for bending and straightening work, too. Support points can be spread to extreme edges of the table for long or irregularly-shaped parts.

Dake Movable Frame Presses are hydraulically operated, and may be powered either by air (in capacities of 25 to 150 tons) or electricity (25 to 300 tons). Write for Bulletin 269B for complete description and specifications.

DAKE CORPORATION

608 Seventh St., Grand Haven, Mich.

Pressing the battering point into the hammer of a pile driver with a Dake Movable Frame Press.















do your operators have this

Time Saver

to help cut machining costs on stub boring operations?



SET No. 11 ILLUSTRATED WEIGHT 350 POUNDS

- -14 to 8" Bore Range in 7 Tools
- Eliminate "cut and try" boring
- --- Precision adjustment to .0001"
- --- Reduce setup and tool changes

10 DIFFERENT STANDARD SETS AND MANY MODIFICATIONS READILY AVAILABLE

Encircle No. 272 on Card, Opposite Page 65

SUPER MICROMETER-ADJUSTABLE STUB BORING TOOL SETS

Your operators always have the right tooling answer at their fingertips—for cutting costs and improving accuracy on non-repetitive boring—when you provide them with Davis Stub Boring Tool Sets. Then time lost at the tool crib is ended. For without once leaving their machines, they can bore from ½ to 8 inches, pencil bere from ½ to 1½ inches and do light, extended boring up to 13 inches.

Highest precision and fine finish are assured by Davis Super Micrometer-Adjustable mechanisms used in all seven basic tools in each set. It prevides a wide range of cutter adjustments to limits of .00012 by simply setting the micrometer screw's dial head at the desired reading. Exceptionally rugged construction makes Davis tool sets ideal for either rough or finish boring aperations. Learn hew this modern tooling idea can save money in your shop.

Write today for Davis Bulletin DB-50.





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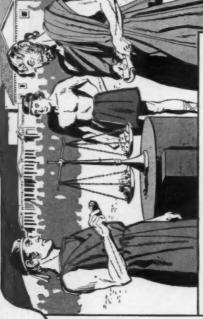
Glddings & Lowis Machine Tool Co. Fond du Lac, Wisconsin

ery was used in ancient MES to abrade and polish metals and other substances.

ON THE HISTORY OF ABRASIVES BY CHICAGO WHEEL & MFG. CO.

NO. 4 OF A SERIES

one of the important milestones in the history of abrasives was the discovery of emery, a dark granular variety of corundum. One of the first to mention emery was the Greek poet, Findar, who wrote in 500 B.C. Aristophanes also mentions it in his comedy "The Peace," about 420 B.C., referring to it as a medium for "rubbing down" and "grinding down." It was of great value to ancient craftsmen in abrading iron and steel,



JHE GREEK ISLE of Naxos furnished emery to the ancient world. Called the "stone of Naxos" it was highly prized, and brought high prices in the market places of Greece and the Near East.







for many applications including the polishing of gems. Even then the size of the grain apparently was important for the type of grinding or abrading to be done. Often the rough HE ENTERPRISING GREEKS took the rough chunks of emery stone and ground them to powder. This was sieved chunks or pebbles were used.



bonded in pottery mixtures and baked to form "whetstones" or grinding stones. We can surmise that these stones were made in various sizes and shapes to suit the work to be done.



cools, implements and weapons after the Ith century B.C. suggest the adoption of better abrasive materials of which emery undoubtedly was the most important. The polishing of metal, gems, statuary and wood carvings was accom-

HE FINER FINISHES exhibited on

sizes and grains of abrasive wheels are made by Chicago Emery today is one of the many abrasive substances employed by Chicago Wheel in the manufacture of grinding wheels and mounted points. Over 200 different shapes, Wheel for every metal finishing operation,

CHICAGO & MFG. CO.

1101 W. Monroe Chicago 7 Dept. MT

Manufacturers of abrasives, precision grinding wheels and mounted points for over 65 years.



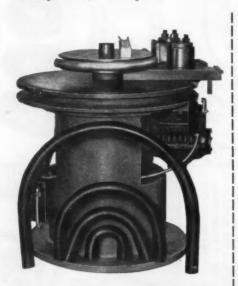
plished with emery of various grains.

it figures!

PEDRICK BENDING COSTS LESS

If it's pipe, tube, or a structural shape-it can be bent faster, cheaper and more accurately on Pedrick Production Benders.

Let us show you how "it figures" with a dollars and cents answer to your particular bending problem. Write PEDRICK TOOL AND MACHINE Co., 3640 N. Lawrence St., Philadelphia 40, Pa. Dept. 3.





FREE "PEDRICK LINE" BULLETIN. WRITE TODAY.

DRICK production benders



PRODUCTION FACTS: Mill two locking lug recesses in bevel gear blanks in one pass.

50,000 Monthly Production with GORTON ROTARY DUPLICATOR

Four spindles operate in pairs with their respective rotating fixtures so that the operator unloads and reloads one pair of fixtures while the other two cutters mill two recesses in each of two beveled gear blanks.

Milling operation is mechanical — no electronic, hydraulic or pneumatic controls are used other than air operated clamps.

CAN PERFORM TWO DIFFERENT OPERATIONS AT THE SAME TIME

Each pair of fixtures is controlled by one of two masters mounted within the table. When one pair of spindles is lowered to fixed depth and the cycle starts, the rotation of fixtures and cross movement of table feed the work to the cutters to produce the desired shape. One pair of spindles can perform one operation on two pieces while the other pair performs a different operation on two other pieces.

EASILY MODIFIED TO MEET YOUR NEEDS ...

ADDITIONAL TOOLS by GORTON

PANTOGRAPHS

Five models of 2- and 3-dimensional machines for engraving, profiling or die sinking — either manually operated or tooled for automatic cutting cycle operation.

SUPER-SPEED VERTICAL MILLS

Three sizes, designed for fine work in the machine shop, tool room and in die and mold shops.

DIE AND MOLD DUPLICATORS

Three sizes of manually operated precision duplicators — also multiple spindle models, either manual control or automatic cutting cycle.

Super-Speed HORIZONTALS, UNIVERSALS, VERTICALS

Six models, featuring 56" tables (28" travel), 62" tables (34" travel) or 76" table (48" travel).

SWISS-TYPE AUTOMATIC SCREW MACHINES

For high production turning of small slender parts to high precision standards.

MACHINES FOR HIGH PRODUCTION

MULTIPLE-SPINDLE ROTARY DUPLICATORS

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For multiple operations at production rates with high repetitive accuracy.

MULTIPLE-HEAD ETCHERS

For permanently marking hardened or finished parts.

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Tracer-Controlled Pantographs, Duplicators—standard and special... Horizontal and Vertical Mills, Swiss-Type Screw Machines, Tool Grinders, Small Tools and Accessories.

A 8218-1PA



can meet all your metal.cutting needs

Whatever your particular cutting operations, there are Victor Hand and Power Hacksaws, Metal and Wood Cutting **Band Saws and Hacksaw Frames** to meet your specific requirements.

Every Victor distributor can give you prompt delivery of any metal cutting saw you want. His men are backed up by Victor factory experts who can show you the way to new speed and economy on production metal sawing operations.

> Remember, no blade on the market will cut faster or last longer than the right Victor Blade-at the price you want!

> > And for top performance at a low price, use Victor "Moly"® High Speed Steel blades. Victor developed this high speed, heavily-alloyed steel blade of molybdenum. Remember, "Moly" High Speed blades outlast standard steel blades 10 to 1, cut as well as the best high speed steel blades made, but are substantially lower in cost.

Ask your Industrial Distributor for a supply of our NEW Metal Cutting Booklets and Wall Charts.

Sold Only Through Recognized Distributors

(1889

VICTOR SAW WORKS, INC., MIDDLETOWN, N.Y., U.S.A.

MAKERS OF HAND AND POWER HACKSAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES, Encircle No. 276 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

lormance

SURVEY

DESCRIPTION OF WORK

Thru-feed centerless grinding piston pins-500 to 1.000 dia. Stock removal .010 to .012 Comm'l finish.

Simonds Centerless grinding wheel 20 x 6 x 12 A60-L65-V1

PERFORMANCE

Consistently gave 80 hours of life. This is double the life of competitive wheel previously used.

CENTERLESS GRINDING WHEELS

Field Surveys repeatedly prove the high performance of these wheels. They cut free, hold their shapes to give tast, top volume production. Write for bulletin ESA 55.

SIMONDS ABRASIVE COMPANY . PHILADELPHIA 37, PA.

tranch Warshouses: Boston, Detroit, Chicage, Portland, San Francisco - Distributors in Principal Crisos Simonás Saw and Stool Co., Pitchburg, Mass. - Other Simonás Companies: Simonás Steel Millis, Lockport, N.Y., Simonás Cameda Saw Co., Lid., Mantreas, Cavebec, Line Grinding Wheels Div., Brockville, Odi. and Simends Canada Abrasiva Co., Ltd., Arvida, Quahac



BOOBBORD





COMPACT DESIGN

HIGH TORQUE

HIGH-RATIO LEVERS SE

POSITIVE NEUTRAL

PRECISION BUILT

LONG WEAR LIFE

EASY ADJUSTMENT

*High-ratio operating levers sive Send for This PULLMORE clutches powerful engagement with slight axial pressure and short movement of the shift er spool; consequently operation is quick and easy. Declutching is equally fast and positive. The shifter spool has an extra deep slot which is hardened and ground. This prolongs the life of the. clutch, reduces wear on the shifter fork and holds run-out to a minimum.

Handy Bulletin

Shows typical installations of ROCKFORD

CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes

capacity tables, dimensions and complete spec-













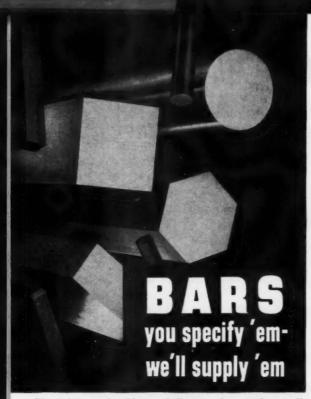


ROCKFORD CLUTCH DIVISION A 1309 18th. Avenue, Rockford, Illinois, U.S.A. A

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MACHINE and TOOL BLUE BOOK



The bulging racks of bars—of all types, sizes, grades, conditions, finishes—at each U. S. Steel Supply warehouse means you can always get prompt delivery of exactly what you want. No need for substitutions or frantic phone calls all over town when you're in a rush... just call us first next time.

COLD FINISHED BARS. Largest variety of sizes, grades, finishes in rounds, hexagons, squares, flats. Including USS "MX" high-speed, low cost screw stock.

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ALLOY BARS. Hot rolled, cold finished and Aircraft Quality. All sold with USS guarantee of minimum hardenability. Each order includes specific data on the alloy bought.

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Our technical staff stands ready to assist you wherever possible with application—or even design—problems. They will make certain that you get the best bar for the job . . . and the most economical.

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Industrial Supplies and
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Name.				-																				
Compo	ny.																						,	
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on your nut setting operations-

for maximum economy

Apex extensions and impact sockets, built of high carbon electric furnace alloy steel, are specifically designed for continuous, hard usage. When wear finally does occur, you replace only the worn part—socket or extension—your tool replacement costs are kept to a minimum.



for maximum torque

Apex straight (one-piece) nut setters are also built of high carbon electric furnace alloy steel. They have no joints, locking devices or movable parts. This one-piece design eliminates backlash and vibration . . . full torque is developed, as power is applied directly from the tool to the work.



for every nut setting operation Apex produces a complete line of impact sockets, extensions, adapters and universal wrenches, each designed and built for a specific nut setting operation. Choose from more than 5,000 stock types and sizes . . . or tell us about your special nut setting problem and we'll work right with you to help find the solution. Catalog 29 is available on request—please use your company letterhead.



sockets, extensions, adapters

THE APEX MACHINE & TOOL COMPANY 1028 S. Patterson Blvd. • Dayton 2, Ohio

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MACHINE and TOOL BLUE BOOK



Wilson"Rockwell"* Hardness Testers

EASY TO USE

SENSITIVE & ACCURATE as a precision balance

DURABLE as a machine tool

3-JR MODEL

Invaluable for tool room use and most production testing



A FULL LINE TO MEET EVERY HARDNESS TESTING REQUIREMENT

FULLY AUTOMATIC

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TUKON MICRO AND MACRO HARDNESS TESTERS • WILSON "Rockwell" Hardness Testers were the first to combine the precision and sensitivity demanded in the metallurgical laboratory, the accuracy required in the tool room plus the ease of operation and durability for daily use on the production line.

A staff of WILSON hardness-testing experts is available to recommend just the size and model best suited for your job. Why not call or write today?

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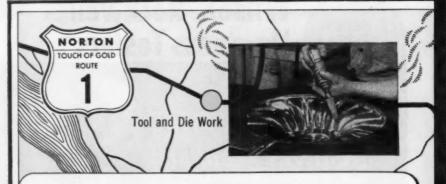


Wilson Mechanical Instrument Division

AMERICAN CHAIN & CABLE

230-T Park Avenue, New York 17, N. Y.





YOUR "TOUCH of GOLD" ROAD MAP TO HARD-TO-REACH GRINDING SPOTS

NORTON MOUNTED WHEELS AND POINTS

bring you big savings on hundreds of small grinding jobs

Norton mounted wheels and points bring the same "Touch of Gold" grinding performance to small or hard-to-get-at areas that the big Norton wheels deliver in the "wide open spaces." Here are some reasons why:

- They stay TIGHT on their spindles, under severest use. Norton developed mounting techniques make sure of this.
- They're trued on their own spindles, which assures: (1) perfect concentricity; (2) sharpness and fast-cutting action; (3) accuracy of dimensions and shape. They're ready for work immediately.
- They're duplicated identically from lot to lot, thanks to Norton's statistical quality control.

They're made in nearly 200 standard shapes and sizes . . . in ALUNDUM', CRYSTOLON' and diamond abrasives . . . in all required bonds . . . and in the reinforced BF construction. For ultrahigh speed precision grinding, special spindles and cement are available.

See Your Norton Distributor

for the mounted wheels and points you need. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas, listed under "Grinding Wheels" in your phone directory, yellow pages. Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

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W-1649





Yoder Cold Roll Forming Machine with Shear Type Automatic Cut-Off and Small Slitting Line installed by Wolverine Mouldings, Inc., Lincoln Park, Mich.



As your business grows, new opportunities arise for drastic cost reduction through the use of cold roll formed parts or finished products.

Decorative metal mouldings is only one of a great many things you can make with a Yoder cold-roll forming machine.

For instance, you can economically make structural angles, channels, etc., up to ½ in. thick. You can form wide sheets or panels into cabinets or shells for refrigerators, ironers, lockers, radio and TV sets, etc. You can make virtually all the components for metal buildings, including trusses, joists, studs, siding, roofing, windows, and doors.

Edges of shapes can be folded in and over to make interlocking joints for cabinets, rolling doors, box and tubular products.

You can, in addition to longitudinal forming, do perforating, notching, embossing, coiling, curving, welding, etc. Sections can be cut to length and ends given almost any shape, plain or fancy, by means of one or two Yoder automatic cut-off machines synchronized with the forming speed.

The Yoder Book on Cold-Roll Forming is an illustrated treatise on the art, the machines and many of the things they can do to reduce cost and increase production. A copy is yours for the asking. Consultations and estimates without cost or obligation.

THE YODER COMPANY 5509 Walworth Ave., Cleveland 2, Ohio

Complete Production Lines

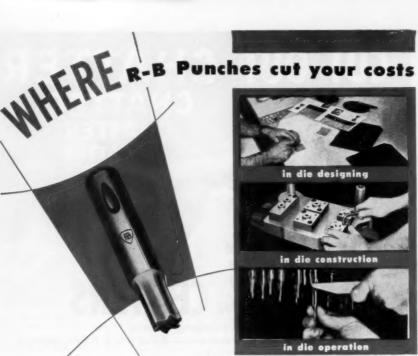
* COLD-ROLL-FORMING and auxiliary machinery

& GANG SLITTING LINES for Coils and Sheets

* PIPE and TUBE MILLS - cold forming and welding

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MACHINE and TOOL BLUE BOOK



IN DIE DESIGNING

. . . you save "board time" by working with the standardized R-B concept of punches, die buttons, punch retainers and die button retainers. R-B standardized equipment reduces drafting time to cut your costs.

IN DIE CONSTRUCTION

. . . you save "building time" because R-B punches, die buttons, punch retainers and die button retainers are furnished completely finished. R-B saves skilled die-maker's time to cut your costs.

IN DIE OPERATION

... you save "press time" because R-B punches and die buttons are instantly removed and replacements quickly inserted. Inherent accurate alignment and positive locking keep press down-time at a minimum to cut your costs.

Use R-B Engineering Service for Your Tough Piercing Problems.

RICHARD BROTHERS PUNCH DIVISION ALLIED PRODUCTS CORPORATION Dept. 75 • 12621 Burt Rd. • Detroit 23, Michigan Please send me additional information. NAME TITLE	SPECIAL COLD FORGED PARTS
COMPANY	PRECISION GROUND PARTS
ADDRESSZONESTATE	SHEET METAL DIES MADE OF FERROUS ALLOYS, ZINC ALLOYS OR PLASTICS



-and eliminate down-time changing wheels, diamonds and coolants—have micro finish, always!

Grind with RED-E and be sure!

- 1. ABEC-7 spec. bearings.
- 2. High speed steel points. 6. Labyrinth enclosure.
- 4. Short overhang.

- 5. Lubricant sealed-in-for-life.
- 3. Locked-in bearing assembly. 7. Accuracy guaranteed to within less than .00005" T.I.R.

	SHANK	SPINDLE		
Morse	1 to 6	2 to 7		
B&S	5 to 16	7 to 18		
Jarno	4 to 20	6 to 20		
Norton	10 to 16	.8125 1.335 1.750		
Landis	.8125 1.335 1.750			
	B&S Jarno Norton	Morse 1 to 6 B&S 5 to 16 Jarno 4 to 20 Norton 10 to 16 Landis .8125 1.335		

New grinder center catalog now available! Call your RED-E Industrial Distributor NOW!

CENTER Specialists Since



550B Iranistan Ave.

Bridgeport 5, Conn.

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"400% Faster!" "Output Up 110%!" "Costs Cut 64%!"

EYE GLASS FRAMES. Driving tiny optical screws — traditionally an "impossible" job for a power driver. Yet Millers Falls is doing it — and cutting labor costs 64%.



MINIATURE MOTORS. Problem: To drive tiny, self-tapping screws without stripping or splitting a thin plastic housing. Solution: Millers Falls No. 52's. Result: Production up 110%.

There's a Millers Falls driver that's right for practically every driving problem



Typical examples of how thousands of companies save time and money with Miller Falls "Adjustomatic"®

Clutch Electric Screw Drivers

TRAVERSE TRACKS. Drive screws too tight—and tracks crush. Not tight enough—and stops loosen. Millers Falls' record on this job: Rejects—negligible. Speed—up 400%.

HEATING CONTROLS. Speed, accuracy, economy — on all three counts, this manufacturer chose Millers Falls after extensive tests with other electric and pneumatic drivers.





Write for full information or let us arrange for a demonstration.

MILLERS FALLS CO. Dept. MT-10 Greenfield, Mass.

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Brighthoy. Brighthoy. that there wider conving a spring of

You can choose a rubber-cushioned Brightboy stock abrasive

You can eliminate the annoyance, expense and delivery delay of made-to-order "specials."

particularly matched

for a given job.

You can count on dependable uniformity, prompt delivery.

Brightbey is available in both Silicon Carbide and Aluminum Oxide Grains. In both grains you have wide selection of uniform textures and grain size ranging from extra fine to extra coarse, in soft, firm and tough rubber binders.

Ask your dealer NOW for details on multi-use Brightboy, and for this new Brightboy catalog. Advise us if he cannot supply you. Write us on any problem where finishing is involved.

"Boy! Are These New Finishing Hints A Help!"

"Our plant is 'right on the beam.'
But not until we received this new
Brightboy catalog did we realize
that there could be such a completely new,
wider concept of finishing and so many timesaving abrasive applications."

Brightboy's big advantages lie in its unique working action. This is the result of rubber and abrasive, working simultaneously. Rubber binders of special textures are "matched" with selected abrasives of various grains. Each abrasive is uniform in dispersion through its "cushioning" rubber binder.

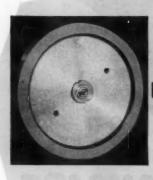
Brightboy often burrs, cleans, finishes, polishes, in one operation. Time savings frequently amount to 50% over other methods. A Bright-

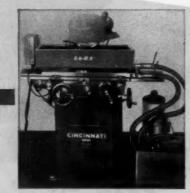
boy precision-finish often constitutes the final polish. Alert production men explore Brightboy applications as regular routine prior to setting up new jobs and to find additional costsavings on current production.





BRIGHTBOY INDUSTRIAL DIVISION WELDON ROBERTS RUBBER CO. 95 North 13th Street, Newark 7, N.J. America's Pioneer Manufacturer of Rubber-Bonded Abrasives







100% more pieces per grind 300% less tools required per job 400% savings in monthly tool cost

the superiority of **ELOX** electrical

discharge grinding was proved by this large automotiv company's** unsolicited 2-mont comparison report

	Tool Name, Description:	Solid Carbide Insert Crankshaft Finish Front & Rear Thrust Bearings							
	Part Name:								
1	Operation Name:								
		Standard Grind	Elox EDM Grind						
	TOTAL PIECES PER TOOL	17,290	95,904						
h	MINUTES PER GRIND	21.0	13.75						
1	COST PER GRIND	\$ 1.26	\$.83						
	ESTIMATED MONTHLY TOOL COST	\$294.71	\$92.19						



Elox will guarantee increased tool productivity over any type of abrasive grinding.

Other Elox equipment available to remove broken taps, drills, etc., from \$495 to \$3450.



732 N. ROCHESTER RD. CLAWSON, MICHIGAN

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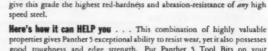
October, 1955

97



TRY and COMPARE





properties gives Panther 5 exceptional ability to resist wear, yet it also possesses good toughness and edge strength. Put Panther 5 Tool Bits on your heavy-duty jobs and abrasive materials—watch them step up your production runn between grinds!

Here's what you GET in Panther 5 . . . A high-carbon, high-vanadium, tungsten-bearing high speed steel with 5% cobalt. Its analysis is designed to

Stocked in ALL SIZES . . . Panther 5 Tool Bits are produced as a finish-ground product. They're carried in stock for immediate shipment in nine sizes of squares, from \(\lambda'' \times 2\lambda'' \) long to \(\lambda'' \times 7'' \) long . . . and in eighteen sizes of flats, ranging from \(\lambda'' \times 2\lambda'' \times 3'' \) long to \(\lambda'' \times 7'' \) long. • \(\lambda'' \times 1 \) long to \(\lambda'' \times 7'' \) long. • \(\lambda'' \times 1 \) long to \(\lambda'' \times 7'' \) long. • \(\lambda'' \times 1 \) long to \(\lambda'' \times 7'' \) long. • \(\lambda'' \times 7'' \) long to \(\lambda'' \times 7'' \) long. • \(\lambda'' \times 7'' \) long to \(\lambda'' \times 7''' \) long to \(\lambda'' \times 7'''' \) long to \(\lambda'' \times 7''' \times 7''' \) long to \(\lambda'' \times

Valuable Data for PRODUCTION MEN ... yours for the asking

/. "HIGH SPEED TOOL BITS"

Handy data on the complete AL line, comprising eight different grades of high speed steel tool bits. Includes shop handling, heat treat methods, etc.

2. "CUTTING TOOL MATERIALS"

This 36-page booklet analyzes and compares all AL grades of curting tools: carbon and high speed steel, cast alloy and carbides. Includes data on handling and treatment.

ADDRESS DEPT. MB-70

For complete MODERN Tooling, call Allegheny Ludium



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MACHINE and TOOL BLUE BOOK

New 6" 18" hand feed

Thompson Grinder

FOR SHOPWORK

Completely anti-friction and permanently lubricated machine, Available with all types of attachments found on tool room surface grinders including interchangeable herizantal and vertical wheel heads. A Thompson high quality precision machine at this low price.



PRECISION PETE says:

FOR LOW COST AND QUALITY YOU JUST CAN'T BEAT THOMPSON Make your next hand feed grinder a Type D Thompson . . . write today for the new descriptive catalog, D-SS ∰ Price F.O.I Subject to

* Price F.O.B. Springfield, Offic U.S.A., Subject to Change Without Notice.

\$2,500

ball, write or wire today

Thompson Grinders

The Thompson Grinder Company at Springfield, Ohio

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Specially selected sizes for the small shop or a standby set where additional blocks are a needed convenience.

Keep a second set with wanted sizes available on instant notice. Avoids delay or even error that might result from using substitute gaging methods.

The 43 Block Set (43 B) has accuracy of ± .000008" and must pass the same test for surface finish, flatness and parallelism of the finest grade of steel blocks.

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and ACCESSORIES

WEBBER GAGE COMPANY
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Largest exclusive manufacturer of precision gage blocks

Send inquiries direct to Webber Gage Company

Now...for the price of a DC welder

ONE WELDER with BOTH AC and DC **WELDING CURRENT**

AC CURRENT CURRENT Lincoln IDEALARC gives you: . both AC and DC welding current

GET THE FACTS ON IDEALARC WRITE FOR BULLETIN 1343

- · dual arc control for both voltage and
- arc-booster starting on DC as well as AC
- operation on single phase power

THE LINCOLN ELECTRIC COMPANY

Dept. 3604, Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

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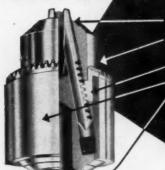


SPECIFICATIONS

 The South Bend 2-H Turret Lathe has the stamina for exacting close-tolerance work, rigidity for fine finishes and ample power for smooth performance. Its quick change gear mechanism powers 48 turret ram feeds, 48 carriage longitudinal feeds and 48 cross slide feeds. The wide selection of feeds insures maximum efficiency on every type of operation. Where can you find a better turret lathe value?

Compared with our costs OUR PRICES ARE LOWER than they were back in 1941	SEND INFORMAT	ION CHECKED	P	49	78	1
WAGES UP MATERIALS UP PRICES UP ONLY 155% 131% 49%	9" and 10"	10' to 14-24'	DRILL	TOOL	Divisit Lanes	BENCH SHAPERS
41 35 41 55 41 55	Name			Street		
Prices are closely tied to costs. Costs are still rising. Buy now before increased costs necessitate higher prices.	City		-	State		THE SOUTH
Building Better Tools Sin	ce 1906 • SO	UTH BEND	LATH	E . South	Bend 22, Ind	iana S.

Here are the points ...



Jaws Nickel Chrome Moly Alloy Steel

Key Holes: do not extend into body cavity thereby sealing out dirt

One Piece Geared Nut Construction

Entire Chuck Body Hardened inside and out

Taper Bore hardened and ground

Chucks and Keys interchangeable with other makes

. that make

Quality

BRAND

Every chuck is individually checked for accuracy . . . you can depend on Supreme Chucks for trouble-free performance and long wear.



2222 S. CALUMET AVE., CHICAGO, ILLINOIS
the chuck that lives up to its name . . . SUPREME

Encircle No. 294 on Card, Opposite Page 65

for more Accurate cuts...
greater Rigidity in

BORING



Use CRITERION BORING EQUIPMENT

BORING PROBLEMS? CLOSE TOLERANCE?

Try Criterion Boring Tools. Built with the same care and quality as the time-tested Criterion Boring Head.

THIS COMBINATION WILL PRODUCE RESULTS.

Boring heads from $1\frac{1}{2}$ to 7 inch diameter. Boring tools, carbide or high speed steel, % to $1\frac{1}{4}$ inches diameter. Bore holes from $\frac{1}{6}$ to 20 inch diameter.

Accuracy for the closest tolerance * Rigidity for the heavy cuts * Heat-treated parts for long wear

LARGE OFFSET SAVES TIME AND TOOL CHANGES

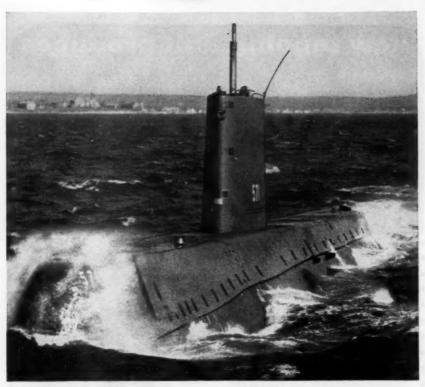
MACHINE WORKS

These tools will cut your boring costs.

See the complete line of CRITERION TOOL PRODUCTS at your local dealers or write for free catalog.

765 W. 16TH ST., COSTA MESA, CALIFORNIA

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Down Deeper . . . Below Longer



Write for new 1955 catalog of Sheldon Machine Tools With those privileged to make atomic and submarine history on the Nautilus (and more recently on the Sea Wolf) was a SHELDON Lathe. Although probably the proudest, most significant voyage, this was not the first time SHELDON Lathes had gone to sea with the U. S. Navy. Since World War II, SHELDON Lathes have been the maintenance lathes on naval craft of many types.

SHELDON

Builders of Sheldon Lathes, Milling Machines, Shapers and Sebastian Lathes
Sheldon Machine Co., Inc. • 4242 N. Knox Ave., Chicago 41, Illinois

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GAUGE PERFECTS PARTS always!

10,000, 100,000 or 1,000,000 parts and more—all precision tapped—without variation, without rejects, without

thread distortion! That's the production record of this remarkable Procunier Lead Screw Tapping Unit! It is truly the most outstanding tapping development in years! Here's the secret: the tap is fed gently, easily, automatically without any pressure on the tap itself—it's completely controlled by the lead screw which quides the tap steadily, quickly, accurately—always! It's easy to operate too! Gentle finger tip pressure actuates the head—eliminates operating fatigue.

Check these facts:

- finger tip trigger arm travels only 3/4"
- tap idles in neutral, reverses at twice forward.
- friction clutch helps prevent tap breakage.
- positive depth stop holds uniform depth.
 produces gauge fits in any pitch from 20
- to 80! • Hardened and
- ground lead screw assembly replaced in seconds for varying pitches.
- tap capacity 0" to 1/4" in soft material—
 0" to 3/16" in steel.
 unique wiper oils
- unique wiper oils and cleans lead screw while in operation.
- lead screw travel 1-3/16".
 can be air operated.

Send for FREE brochure giving full details, specifications and prices on this new lead screw tapping unit. You'll quickly see why it is the most efficient tapping head made—bar none!

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smaller in
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affords easier
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shoulders,
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Photo at Massey-Harris-Ferguson, Inc., Racine, Wisconsin

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This plant realizes substantial savings in machining time and cost by checking surface finish of parts with the Brush Surfindicator. They report: "With the Surfindicator we immediately see if parts are within design requirements for finish. Reworking of finished pieces to meet specifications has been eliminated." The Brush Surfindicator is portable, easy to set up and use, indicates surface roughness in microinches directly on a large meter. For complete information write Brush Electronics Company, Dept. I-10, 3405 Perkins Avenue, Cleveland 14, Ohio.

*Trade-Mark

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INDUSTRIAL AND RESEARCH INSTRUMENTS
PIEZOELECTRIC MATERIALS • ACOUSTIC DEVICES
MAGNETIC RECORDING EQUIPMENT AND COMPONENTS



COMPANY

Division of Clevite Corporation

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MACHINE and TOOL BLUE BOOK



within a set, and are also held within .00002" of exact size. They are the accepted standard equipment for making pitch diameter measurements of taps, thread gages, precision threaded parts, hobs, worms, splines and gears. For the great majority of 60° Unified and American threads, the Set No. 20 pictured at the right will fill your needs. Similar sets are available for single-start threads of other pressure angles. For threads which have a lead angle greater than five degrees, or multiple-start threads and worms, special size wires should be used. Correct sizes and constants can be easily determined from the Van Keuren Thread Measuring Tables or from the new formulas presented in Catalog and Handbook No. 36.

Set No. 20 Thread Measuring Wires is a plant necessity for maintaining taps and thread gages within their limits for wear and for proving the pitch diameter of screws and threaded parts.

Thread Measuring Wires

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Special wires from .002" to 2.000" diameter are made to any tolerance required.

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Car door handles - Checking internal groove diameter and the relation of groove to a face.

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checks internal and external threads 8 to 10 times faster!



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Spark plugs - Checking an external thread and the concentricity of an angular seat to the axis of the



Telephone Handset-Checking external thread.

You can speed up qualify control and reduce inspection costs with the Bryant B-21 Bench Gage. Partially turning the work inspects the thread – with utmost accuracy – with

visual indication of assemble-ability!

This Bryant gage checks threads in all tolerance classes and in sizes ranging from %15" to 5" diameter for internal threads and #8 to 5".

sizes ranging from %6" to 5" diameter for internal threads and #8 to 5" diameter for external threads.

The gaging contacts are a pair of threaded segments, which are interchangeable to cover a wide range of diameters. Both "Go Form" and "Pitch Diameter" segments are available. These segments have

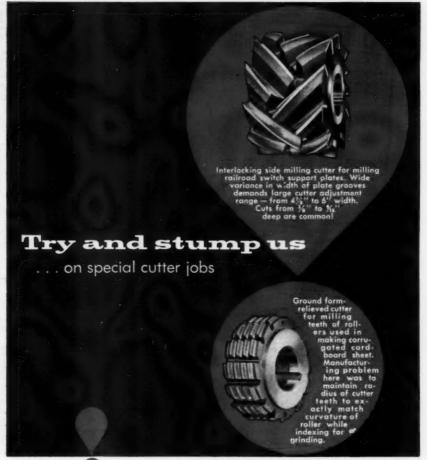
a much longer life than conventional plugs and rings. Attachments for checking squareness-of-face and concentricity in relation to the axis of a thread are also available.

Write for data sheets on the B-21 Thread Gage and other Bryant gages.

Bryant Gage and Spindle Division, Box 620E, Springfield, Vermont, U. S. A.

Division of Bryant Chucking Grinder Co.

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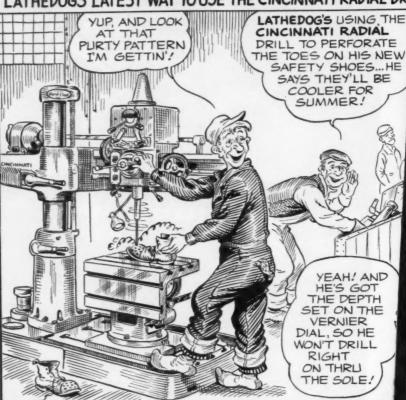
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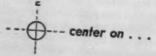
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October, 1955

111

LATHEDOGS LATEST WAY TO USE THE CINCINNATI RADIAL DRI





cincinnati



Large-size prints of this J. R. Williams cartoon are available.



The Cincinnati 3' 71/2" Radial Drill is built around a new Hardclad column designed for enduring accuracy. Centrifugally cast from high-density iron, Flamatic hardened and ground to close tolerance, this new column provides extreme wear resistance and retains its precision through long service. Operation is easier, too, with speeds and feeds both selected on Cincinnati's exclusive Color Match dials. Drilling capacity of 11/4", plus a long list of special features, makes a Cincinnati Radial your best buy for the majority of your drilling jobs.

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Office, Factories and Show Room GRAND HAVEN, MICHIGAN

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MACHINE and TOOL BLUE BOOK

NEW Rotor B-35 Vertical Air Grinder PAYS FOR ITSELF IN 14 WEEKS

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Now: Rotor Application Engineer suggested switching to new Rotor B-35 Vertical Grinder at 6000 rpm with a harder wheel.

Results: Saves 8 minutes per casting... 40% more output with 60% use factor. Savings paid off tool in 14 weeks. Wheels last longer. Cuts operator fatigue.

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TAPPING ATTACHMENTS

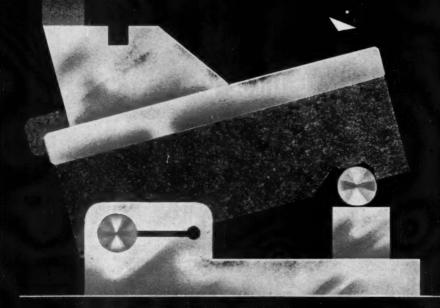
Reversible safety tapping attachments with adjustable graduated friction drive, hardened, ground and lapped, complete with torque bar and handles. Precision

made
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by long established reputable West German factory.

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- constant pumping action
- · chips or grit cannot interfere
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- carbon seal, if desired
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Belt, motor or direct drives.

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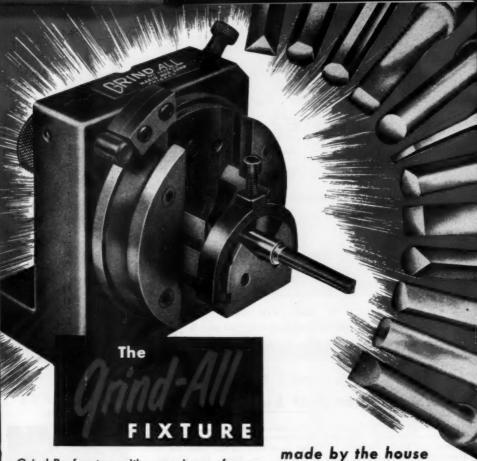


THE FULFLO SPECIALTIES CO. Inc.

PUMP AND VALVE MANUFACTURERS BLANCHESTER, OHIO

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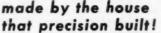
MACHINE and TOOL BLUE BOOK

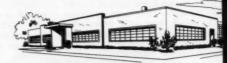


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...and GISHOLT SUPERFINISH breaks another cost barrier!

Do you think of SUPERFINISH as an expensive process? Then it's high time you know the facts.

Here's an excellent case in point ...on the record-breaking Douglas "Skyray." Among the most precise parts on this supersonic jet are the slide valves. They're ground from the solid, first on a cylindrical grinder, then on a centerless grinder. Then they're transferred to a Gisholt Superfinisher where

the bearing surfaces get a finish of 3 micro-inches, r.m.s. Former time for hand-lapping ran from 2½ to 3 hours per piece. The Gisholt SUPERFINISHER does it in 45 seconds! Think of it: less than 1/200th of the time! And think what that does to costs!

If SUPERFINISH can improve your product, as probably it can, better get the facts. Write today for complete information — ask for "Superfinishers," Form 1169.



SISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here,



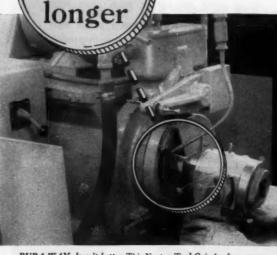
GISHOLT

Madison 10, Wisconsin

Approximate diam. of slide valves (lower left) is ½" with reduced diam. of ½" between collars, or bearing surfaces. Parts are handled on the Gisholt Superfinisher in only 45 seconds per piece.

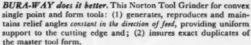
Unequalled

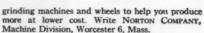
for carbide tool sharpening, the Norton No. 2 Bura-Way Grinder...



makes

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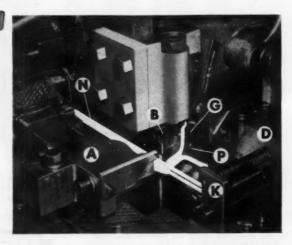
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steel strip 0.05 in. thick by 0.625 in. wide . . . made in steps A, B and C.



Final step in forming Kaz stands on Nilson 4-slide. Feet are spread, bent, crimped (G) with workpiece (P) on centerpost while next piece (N) is being cut off. Stop (K) on right slide (D) backs off after cut and workpiece (P) is wrapped around centerpost by die (A) when finished part is clear.



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- Quick vertical adjustments of table and drillhead
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—the built-in Quality which provides trouble-free satisfaction and long life.



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STANDARD GAGE COMPANY, INC.

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MACHINE and TOOL BLUE BOOK



Power THAT KEEPS ITS distance

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Whatever the job — grinding, sanding, buffing, polishing, filing, brushing or deburring — Haskins equipment handles it easily, quickly, economically and profitably. Haskins equipment provides plenty of out-of-the-way power for even the most sustained operations . . . with a minimum of operator fatigue. That's why, for over 36 years now, the nation's finest and largest (and most profit-conscious) metal working plants rely on Haskins as standard equipment.

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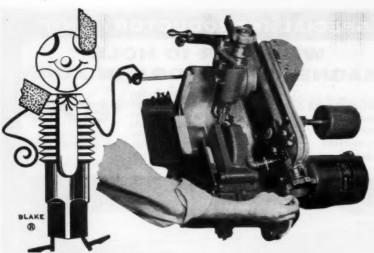
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126

MACHINE and TOOL BLUE BOOK



Get BETTER threaded holes, MORE threaded holes with Blake "Tapsaver" Grinders

and here's the Proof

ACCURACY... of taps ground by Blake Flute and Chamfer Grinders keeps threaded-hole production high and uniform.

CONSISTENCY . . . of threads cut with Blakesharpened taps speeds up assembly and inspection operations.

SAVINGS . . . result from both decreased tap costs and increased productivity when taps are kept sharp the Blake way. You Can Keep Your Taps Sharp!

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BLACK DIAMOND PRECISION DRILL GRINDERS . SURFACE FINISH STANDARDS

SPECIAL INTRODUCTORY UNIT

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Cut die costs drastically, start production quicker This M-12-14 Complete Introductory Unit includes a set of blank templates, ten punches, dies, strippers and punch and die retainers complete to make up a 10 hole precision perforating die. Any diameters from ½" to ½" to your selection. Catalog illustrates additional re-use economies.

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WHISTLER DIES ARE

Featured in this issue

Interview with D. J. Davis	149
Stop Tool Damage	155
Diamond Tools Cut Machining Costs	190

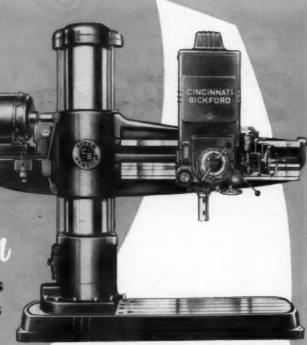
Capital Roundup, by Arnold Kruckman, Blue Book Washington Correspondent. Mr. Kruckman points out that some control or diversion of disastrous hurricanes is needed; and the use of \$1 a-year-men in Washington are to be curbed under the defense mobilization program. Page138

Interview with D. J. Davis, vice-president—manufacturing Ford Motor Company, deals with present-day manufacturing problems in the automotive industry. Mr. Davis also reviews Ford's cost anaylsis program and replacement policy. He predicts "another banner year" for the industry and suggests American families will eventually have three and four automobiles. Page149

Stop Tool Damage, Theft and Hoarding with Tool Control System, by T. F. Dunton, Superintendent of Perishable Tools and Supplies, Carrier Corp., Syracuse, N.Y. This article outlines a comprehensive tool control system which makes tools available in a moment's notice and eliminates most of the confusion, losses and damaged tools suffered in many high production shops. This system places direct responsibility on the operator for the operating efficiency of the tools he uses. Page...155

 Drill Press Automated to Eliminate Manual Lever Pulling, by C. T. Bower, consultant tool engineer. The author reveals how a drill press can be mechanized with a mechanical attachment which eliminates the need for compressed air, and which provides automatic feeding and unloading.

 100%
HYDRAULIC
preselection
of 36 speeds



DULSIMPLE PRESCHEDULING

Pre-selection of all speeds and feeds is a new development in radial drill design that saves time and effort. At any time, merely turn 2 convenient direct-reading dials to the proper speed and feed for the next operation. Gears shift hydraulically—quietly and quickly.

Pre-scheduling of radial drill operations is conveniently and simply done without expensive, complicated programming attachments on Super Service Radials. These features will cut drilling costs.

BICKFORD



Get all the facts by writing for Booklet R-33.

RADIAL AND UPRIGHT DRILLING MACHINE

THE CINCINNATI BICKFORD TOOL CO.

AS THE Editor SEES IT

Let's be Wary of Russian Visitors

The communist world is turning to America for help—the kind of help that someday might be turned against us.

And it seems to have started a new craze among some of our business leaders who should know better. These businessmen want to act as hosts to visiting Russian technicians. Apparently, our State Department is concerned about this situation, and is not too eager to prolong the stay of the Soviet visitors.

Recently several groups approached the State Department with a proposal to have a group of Russians visit our industrial plants on an exchange basis. We hope officials in Washington will block this invitation.

Americans should never forget the terror, brutality, death and destruction the Kremlin has inflicted on half the civilized population of the world.

What is behind this new Russian change of pace and face?

Their current willingness to make deals, relax pressures, talk peace does not mean they have altered their longrange objective of world domination. They'll turn frigid as soon as the change is expedient.

They are buying time. And the launching of her next Five Year Plan

in 1956 will find the communist leaders working to integrate the Soviet economic, political and military effort more closely with that of European and Asian satellites. Russia still has five million men under arms, a fact not to be taken too lightly.

What do the Russians want from America?

It would seem from recent Soviet government announcements they are anxious to learn American agricultural methods.

But we think they are more interested in American production "know how," which is our one and only big weapon not in Russian hands.

We taught the Japanese production methods and subsequently paid dearly for it. Therefore, if we are to avert another Pearl Harbor, we should keep Russian technicians out of American factories.

The machine tools produced in this country have made our high production standards possible. We should be very cautious in passing along any of these machines or their blue prints to the Russians. After all, we don't want the carbon copy to destroy the original.

VICTOR G. MORRIS Managing Editor



Form and Duplicate a Wide Variety of Shapes in Metal as Heavy as 16 Gauge — Widths up to 24" — with Versatile DI-ACRO BRAKES

A number of forming jobs can be done with the Di-Acro Box Finger Brake by simply adjusting or changing the type of mounting bar on the contact surface. Di- Acro Finger Brake is:

- 1. A Box and Pan Brake-when equipped with a complete set of Box Fingers.
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 - A Bar Folder—when an Acute Angle Bar replaces the Box Finger mounting.
 - A Standard Brake—when a Forming Bar is mounted for heavy operations.

*pronounced Die-ack-ro Creators of "Die-Less Duplicating"



WANT MORE INFORMATION? Send for 32-Page Catalog

O'NEIL-IRWIN MFG. CO. 314 8th Ave., Lake City, Minn.

Encircle No. 320 on Card, Opposite Page 65



very truly!

Letters to the Editor

Milling Head

I am interested in locating a vertical milling head, including its own drive motor and feed mechanism. The unit I am looking for would be quite similar to the Bridgeport or Tree type milling head. However, I would like to get something which would have a little more power (approximately 1½ or 2 hp.)

I intend using this milling head on a planer which I am converting to be used as a miller. I have already arranged to convert the planer speeds. However, if you have any suggestion on this, I would be most pleased to receive it.

A. J. Alessi, Chief Eng. Adolph Gottscho, Inc.

Extrusion Presses

We are interested in a complete list of companies manufacturing extrusion presses designed for extruding aluminum.

K. Gordon Lawless, Purchasing Agent Southeastern Tool & Die Co., Inc.

Information sent.

Time Study

I have recently completed your series of articles in the Blue Book on time study. I think that Mr. Harold R. Nissley did a very commendable job in answering the problems related to this highly specialized subject.

In a recent issue of Blue Book, I observed that you are preparing a booklet that will contain a summary of all of Mr. Nissley's articles on time study. I would appreciate a copy of this booklet when it is made available.

Future articles in Machine & Tool Blue Book on time study and related industrial engineering subjects will be looked forward to from this reader.

W. Richard Weachter, Industrial Eng. Fuller Co.

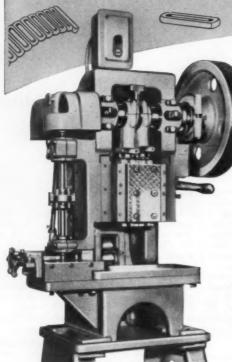
We have followed with interest Harold R. Nissley's article "Time Study" parts 1 thru 11. I feel file copies of the article for our time study people would be of great value. Please advise of the availability of reprints of the article. We are interested at this time in about ten copies.

M. Don Doyle Supervisor, Methods & Time Study Cincinnati Milling Products Div. The Cincinnati Milling Machine Co.

Will you please add my name to the list of persons interested in obtaining a

PERKINS 2AAT and 3AAT TRANSFER PRESSES

FOR PERFECTION STAMPINGS
OF SMALL PARTS



New 2AAT Transfer Press

Perkins announces the Double Plunger Transfer Press—the result of years of engineering design and development.

These machines are widely used for forming small parts—are equipped with roll feed—perform 2 operations simultaneously by moving the piece from one plunger to another by means of an automatic transfer attachment.

The No. 2AAT press has a capacity of 7 to 10 tons while the larger 3AAT model is rated up to 15 tons capacity. Both presses are available for prompt delivery. Prices and specifications gladly furnished on request.

Address all inquiries to Dept. BB-10

PRESSES BUILT TO SPECIAL SPECIFICATIONS



PERKINS MACHINE CO.
WARREN, MASSACHUSETTS

Encircle No. 321 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

copy of the forthcoming booklet on time study by Harold R. Nissley?

If you will let me know when the booklet is available, I will forward the purchase price.

Walter D. Smith, Ind. Eng. Union Steel Products

The time study booklets are now ready and are being mailed at cost.

Depreciation

We would appreciate receiving six reprints of the article "New Profits Through Depreciation" by your Mr. V. Morris.

K. J. Richter, Process Eng. Heinemann Electric Co.

Simplified Drafting

If available, please forward six sets of tear sheets covering the article "Simplified Drafting Boosts Drawing Room Productivity" which appeared in the July issue of Machine and Tool Blue Book.

J. Billingsley, Staff Asst. Fairbanks, Morse & Co.

Machining Aluminum

Please send to the attention of the writer, one copy of Machining Aluminum with Automatic Screw Machines.

A. O. Tressel, Planning Dept. Boston Gear Works

Tear sheets sent.

Information, Please

We would like to get some further information on the new universal drafting machine that Mr. Clifford T. Bower described in his article: "Increase Output With Special Drawing Board," in the December 1954 issue of MACHINE and TOOL BLUE BOOK.

We would also like to know if there is a sales outlet for these machines in the

United States.

Earl M. Patterson, President The Portage Machine Co.

Drawing Board

In the December 1954 issue of your magazine, an article titled "Increase Output with Special Drawing Board," on page 290, told about a drafting machine that has a combination pantograph and parallel. We are interested in securing more information about this machine and would appreciate you sending us the name of the manufacturer of this machine.

L. D. Chamness
Senior Layout Draftsman
Friden Calculating Machine Co.,

Information sent.

We are interested in mechanical fingers formerly made by Adco Mechanical Finger Co. of Dayton, Ohio. Dayton Chamber of Commerce advises there is no such company there now, unless they are operating under other name. Any information as to source of supply for these mechanical fingers will be appreciated.

E. R. Kennedy, Owner E. R. Kennedy Ind. Tool & Sup.

We are very much interested in the article on "Helical Carbide Milling Cutters" on page 150 of your January issue.

It is stated in this article that the cutters are manufactured by the Sonnet Tool & Manufacturing Company, a division of the Sonnet Supply Company, under the name of Helicarb.

However no address is given and we cannot locate this company . . . If you have this address available will you please send it to us.

Folger Adam Joliet, Illinois

I would appreciate it if you could inform me the best source of information on Die Sinking procedures, methods, tools, etc. especially aluminum castings of the type used in the aircraft industry. Any information in the form of books or literature and where to obtain.

A. E. Erickson, Supt. Holt Tool & Die Co., Inc. Information supplied.

Below Zero Chilling

Please forward reprint of the article, "Below Zero Chilling Toughens Metals, Increases Tool Life," by Victor Morris, which appeared in your January, 1955, issue.

Paul Starks, Buyer The Kaydon Eng. Corp.

Spade Drills

With reference to an article in the MACHINE and TOOL BLUE BOOK of April, 1954, you have on page 182 an item "When Drilling 1½" to 5" Holes Spade Drills are Economical . . . Efficient." Would you kindly send us a reprint of this article . . . We have not read the original and feel we will profit by the information you have to offer.

Haig Chookaszian Machine Specialties

Copies sent.

man on the wing

Great things were happening in aviation 45 years ago when we launched the idea of scientifically selected industrial diamonds and set up our little factory to make the diamond tools that were to be so vital to aviation.

Louis Bleriot had won \$5,000 offered by London Daily Mail for the first airplane flight across the English Channel. Piloting his 24 H.P., 450 pound monoplane to the dizzy height of 250 feet, he had spanned the 21 miles of open water in 37 minutes. The challenge echoed across the Atlantic and 1910 saw a brilliant parade of dramatic "firsts."

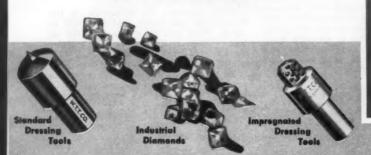
Glenn Curtis won \$10,000 offered by New York World in a 150 mile race with a train. Charlie Hamilton won \$10,000 offered by New York and Philadelphia newspapers for flying a round trip between those cities in one day. Walt Brookins won \$5,000 offered by Atlantic City Aero Club for reaching a height of one mile.

Ely took off from the deck of a cruiser and flew two miles to Norfolk in the first ship take-off flight. Phil Parmalee got \$5,000 for flying five bolts of silk from Dayton to Columbus, Ohio, in a store publicity stunt—the first merchandise shipped by air.

Engineered Diamond Tools* were also a "first" in those early years but their dramatic moment came when war brought critical need for speed and precision in engine production. Then they proved abundantly that nothing cuts like a diamond and that no diamond tool performs like one that is engineered to its job.

*Engineered Diamond Tools means diamond tools engineered to the job and guaranteed to do it.

WHEEL TRUEING TOOL COMPANY OF NEW JERSEY
33 West Street, Bloomfield, N. J.
WHEEL TRUEING TOOL COMPANY OF CALIFORNIA
5560 Alhambra Ave., Los Angeles 32, California
WHEEL TRUEING TOOL COMPANY OF CANADA, LTD.
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1910 Our 45th Anniversary 1955



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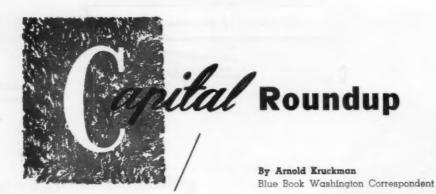
Southwestern Plant: Dallas, Texas

Distributors in Principal U.S. Cities—Agents Throughout the World

MEMBER

Radius Forming Tool "Tru-Line" Profile Dressing Diamond Grit Tools for Thread Dressing "Tru-Thread" Thread Dressing

Encircle No. 322 on Card, Opposite Page 63



Ralph Baldenhofer Returns to BDSA Post

THERE appears to be at least one pleasantly positive result that has come from the historic disaster that followed the course of Hurricane Diane up the New England Coast, and that is the return of Ralph R. Baldenhofer to the metal and metallurgy group of the BDSA. Mr Baldenhofer left as per schedule around the first of August for his home job as Executive Vice President and Treasurer of the Thompson Grinder Company, Springfield, O. As reported in this Letter, no one has come to take his place. The Secretary of Commerce and the top-shelf people in BDSA wanted him to remain. but the home folks felt he was more urgently needed back there than he was in Washintgon.

This eruption of hurricanes from the Caribbean has knocked many plans galley west, and it may make it absolutely imperative for Baldenhofer to stay here another six months—or at least it may be necessary for the home people to share him with Washington. Baldenhofer himself feels there are

- Control or diversion of disastrous hurricanes sought
- resources inventory expected to help flood, hurricane and tornado areas
- anti-trust witnesses are sharply outspoken against government regulatory agencies
- machine tool pool-order program still not in final form
- Eisenhower signs Universal Military Training Act with some reservations
- use of \$1 a-year-men to be curbed in defense mobilization program

many things here that he should still do; and, of course, with the monster tragedy of the hurricane back of us, and ahead of us, there may be added reasons for his urgent need here.

In New England, particularly in the States with the machine tool industry and with an industry devoted to metals and metallurgy, the Hurricane Diane ROSS
FOUR WAY REMOTE CONTROLLED



- May be Removed without Disturbing Piping
- For Air and Low Pressure Fluid Service
- Working Parts Interchangeable with Ross
 700 Series Base Mounted Valves
- Poppet Type for Extra Economy



Roundup . . .

is responsible for the appointment of at least three different State Commissions in Connecticut, Rhode Island and Massachusetts. The group in Connecticut includes fourteen machine tool specialists. Each of the other States have a similar number in the respective groups and include machine tool specialists. There are also representatives of the other metal and metallurgy industries, such as for instance those concerned with the copper industry. The word here is that the largest number of those employed in the copper industry in the New England States have been moved to other States where there are plants and where their services are much needed. It is expected they will all have employment in these plants elsewhere until the plants at home in the New England States have been drained of water and cleared of mud and put in condition to function.

Hurricane Shelters Needed

The same holds good of the plants devoted to the machine tool industry. It is assumed the workers either have been or will quickly be transferred to the points where their services are needed immediately. Again, as soon as the home places in New England are made ready, and adequate preparations are made to give them proper housing and living accommodations and the supplies and the services that are built up during the years in the business centers of the towns, they will be moved back home. It is obvious the need to build decent shelter, and to restore the roads, and to insure adequate water for domestic uses, together with the multifarious services of all the large or small Main Streets, are just as much an urgent essential as the restoration of the plants in which they work. No one yet has been able to even hazard a guess when the result

may be approached.

The Department of Defense, having the most immediate stake in the problem, is, of course, the leader in the driving effort by the Federal Government. The Commerce Department, through the BDSA, heads up much of the planning and working under the leadership of the civil side of the Government. The BDSA has set up headquarters in its offices in Hartford, Connecticut, which seems to have been made the nerve center for what is done. under the leadership of the Department of Commerce. Naturally, every Agency of the Government that has anything which it can contribute to the effort is doing its utmost. The effort is now under way by which the various Departments contribute personnel to give expert services where they are needed for the rehabilitation and restoration in the area. Also, at this writing, they have joined the State Governments and the Federal Defense Department to prepare such protective measures as suggest themselves against possible further damage by Hurricane Edith, and other weather disturbances which it is suggested may be brewing in the Caribbean, until the Fall season is well over.

Resources Inventory Completed

It seems almost like a miracle that the Department of Defense during the past year has made a survey of the numerous resources that should be available in the case of devastation exactly such as has taken place in New England and elsewhere. This survey



Lamina guide pin bushings provide you with permanent, precision-finished inside diameters, full-length bearing surfaces and free, smooth running action. This is your assurance of precision alignment, longer die life, more accurate operation . . . high quality stamped parts, lower maintenance and production costs.

Complete data on these famous Lamina Products is clearly shown in our new Guide Pin and Bushing catalog. Contact us or see your die set manufacturer for your free copy.

*PATENT PENDING



Roundup . . .

was made under the direction of O. H. Dersheimer, Staff Director, Commercial and Industrial Activities Division, Office of the Assistant Secretary of Defense. It was Mr. Dersheimer whose Division made an inventory of the commercial and industrial facilities particularly that he might be able to report intelligently to the Subcommittee of the Small Business Com mittee of the U.S. Senate which has been investigating Government competition with private business. The report was made within the past few months. Aside from the usual inventory of munitions and the many different parts that go into a listing of munitions, it included textile products; millwork plants; factories that produce furniture, chemicals, rubber, glass products, boilers, blast furnaces, foundries, tools, all kinds of metal products; diesel engines and other internal combustion engines.

Machine Tool Inventory

The detailed inventory of machine tools embraces establishments engaged in manufacturing power-driven machine tools that shape metal by grinding or progressively cutting away chips. Important products include boring, broaching, drilling, gear-cutting and finishing, grinding, milling and planing machines; lathes, shapers, and slotters; honing and lapping, polishing and buffing, sawing and cutting-off, contour-sawing and filing, tapping, threading, and rifling machines, and replacement and repair parts for machine tools. The rebuilding of machine tools is included in the inventory list in this industry.

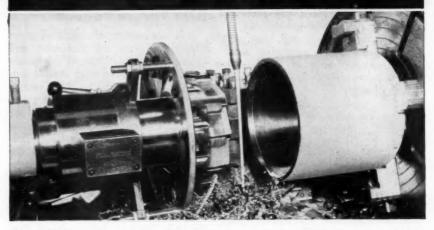
Metal working machinery is also listed, as are machine-tool accessories,

and machinists' precision tools: establishments engaged in manufacturing attachments and accessories for machine tools and other metal working machinery; small power-driven cutting and shaping tools and tool holders; and precision measuring tools. Defense Department regards as important products of this industry: (1) attachments for lathes, boring, drilling and milling machines, and other machine tools; balancing machines; die-casting dies; jigs, fixtures, drop-forging dies, forming and stamping dies and punches, and sub-presses; tools for screw and automatic machines; and semi-finished products such as die sets, leather pins, dowel pins and die springs; (2) arbors and collars; broaches; collets or sprockets; counter bores; countersink drill combination; drills, cutters; reamers;



"You oversimplify by saying it's just 'push-button' operation—don't ever use that term 'push-button' again!"

INTERNAL THREADS TAPPED TO A. P. I. TOLERANCES . . .



High Production Tapping Stands Rigid "100% Inspection"

Casing couplings are subjected to enormous strains created by the weight of the suspended casing, as well as to tremendous internal and external pressures. For these reasons they require threads of extreme accuracy. Thus the prime consideration in the selection of equipment for the production of these threads is that it produce A.P.l. threads at economical production rates.

The operation shown here is one of many where internal tapered threads are cut to A.P.I. to!erances at high production rates by Landis LL Receding Collapsible Taps. 8 pitch round form threads are cut in Grade N80 casing couplings 10 3/4" in diameter to a length of 4" with a 3/4" taper. Production is high—averaging consistently about 17 surface feet per minute with threads meeting A.P.I. tolerances.

Landis LL Receding Collapsible Taps are designed and built for this type of work. The receding mechanism causes the chasers to recede into the tap head automatically at a rate equal to the taper of the thread being cut. When the thread is completed the chasers collapse into the tap head, and the tap is withdrawn.

Each tap has a wide range of cutting diameters since the tap heads are detachable and interchangeable. For example, if furnished with appropriate heads, the 6LL Tap Body, shown here equipped with a 10" ALM Tap Head will cut threads in all pipe sizes ranging from 6" to 12" inclusive. The style LL Tap Body is made in four sizes to cover a range of nominal pipe sizes from 1" to 12" inclusive.

Write for Bulletin G-95

LANDIS Machine CO. WAYNES! ORD

Encircle No. 325 on Card, Opposite Page 65

Roundup . . .

threading tools (taps, dies, and pipethreading tools); and other cutting tools and tool holders; (3) precision measuring tools (micrometers and verulers); gauges (plug, ring, snap, and thread); and other measuring tools. [The manufacturing of hand tools (except power-driven) is excluded from this definition].

There are forty five more pages of fine print, closely set text listing the inventory and the classifications as gathered by the Department of Defense. Obviously under the present stress and strain of shifting industrial production that is urgent from plants that are inevitably and unavoidably shut down to those who can continue, this list is of extraordinary value both to the Federal Government and to others, who are responsible, to whom it will be made available if necessary. If you wish an outline of the manner in which you can do business with the various parts of the Department of Defense, under present circumstances, or as ordinarily a unit of small business, you will find a fairly clear statement in the document issued by the Subcommittee of the Select Committee on Small Business, United States Senate, 84th Congress, First Session, with a subtitle on "Government Competition with Private Business." It is dated April 6, 1955 and is printed for the use of the Committee. In the left hand corner it bears, in very small type, the number 61,329. You can undoubtedly secure a copy by writing to the Secretary of the Subcommittee, Select Committee on Small Business, United States Senate: or to the Chairman of the same Subcommittee, Senator John Sparkman, Washington 25, D.C. Or you might get a copy from your own Senator, or Member of Congress.

Expert Witnesses Outspoken

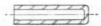
It is interesting that expert witnesses appearing before the Anti-trust and Monopoly Subcommittee of the Senate Judiciary Committee were sharply outspoken in their opinions that Government regulatory agencies are the greatest promoters of monopoly within the American economy today. Professor James Markham, formerly Chief Economist and now a Consultant to the Federal Trade Commission, stated the Robinson-Patman Act led to higher prices and rigidities in the economy and that monopoly violations should be met with tough enforcements of the basic Sherman Act provisions, Professor Walter Adams accused retiring FTC Chairman, Edward F. Howrey, of "Administrative subversion of Congressional intent" by refusing to enforce the Robinson-Patman Act which had been passed by Congress and made the responsibility of the Federal Trade Commission, Professor Adams also accused the Attorney General's National Committee to Study the Antitrust Laws of being in favor of "hard competition" when it called for lessening the usefulness of the Robinson-Patman Act, but of refusing to be equally unequivocal in calling for "hard competion" through all-out enforcement of the Sherman and Clayton Acts. In his testimony, Dr. Adams stated that Government regulatory agencies largely should be abolished so far as monopoly is concerned.

George J. Burger, Vice President, National Federation of Independent

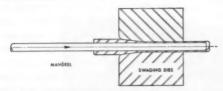




This extra deep, thin-walled cup would be impossible to make by the usual method of deep drawing in a press. But swaging provides an easy solution to the problem.



A cup is drawn having the same volume of metal in the wall as the desired finished cup.



By swaging the drawn cup over a hardened mandrel, the wall is thinned and the cup lengthened to required proportions.

Look at the possibilities swaging holds for you!

- 1. Fast—can be performed by unskilled workers to produce more pieces at lower cost.
- 2. Economical—saves on skilled labor and material . . . no chips, no waste, no scrap.
- Accurate hardens metal to give it added strength, better finish and dimensional accuracy.

Write for our informative booklet on swaging. Our detailed descriptions of Torrington Rotary Swagers and their capabilities may start you on the road to your own "Swaging Success Story."



THE TORRINGTON COMPANY

Swaging Machine Division 580 North Street, Torrington, Conn. Makers of Torrington Needle Bearings

TORRINGTON SWAGING MACHINES

Encircle No. 326 on Card, Opposite Page 65

Roundup . . .

Business, told the Subcommittee that the "consistent, vigorous, enforcement of the anti-trust laws is the only major item which will keep small business in our over-all economy." Burger, and other witnesses, called for more adequate appropriations and staffs for the Anti-trust Division of the Department of Justice and the Federal Trade Commission, so that small and independent businesses can be protected from discriminatory and monopoly-producing business practices.

Machine Tool Rental Plan

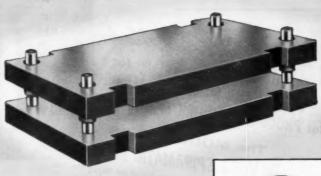
The Defense Mobilization Quarterly Report of the Office of Defense Mobilization to the Joint Committee on Defense Production stated the elephant machine tool expansion program is well along toward completion, and that the leasing of Government-owned tools for non-defense purposes is increasing very rapidly despite strong opposition to this use of public tools. The Mobilization Day machine tool pool-order program is still not in final form, with at least two more months needed for completion. Office of Defense Mobilization feels that the present rental rates of Government-owned production equipment are adequate and in line with private industry charges. The Atomic Energy Commission is contemplating more use of price differentials to broaden its mobilization base, especially in relation to machine tools. The Air Force wishes to revise the Mobilization Day program to provide for the protection of subcontractors; and it is the belief that an effective manpower mobilization plan is far from completion.

\$1-a-Year Men Curbed

At the same time the President signed the UMT law he also approved the law which arranges for a special method of allocating and giving priorities in funneling materials to military and atomic contracts. Means are provided by which the President and the Department of Defense may help materially in building defense plants or in extending their capacity. A new provision of the Defense Production Act puts a curb on some uses of "dollar-a-year men" in the defense mobilization program. The "dollar-a-year men" may be designated to Administrative posts in the mobilization program but they may not participate in policy making. In the same broad Act the Senate Appropriations Committee voted for themselves \$92,923,647. A large part of this sum goes to the Senators as an increase to buy air mail and special delivery stamps, and to buy certain types of stationery. The mileage for travel by the Senators and others-but particularly the Senators-is substantially increased by 10c per mile. Some of the employees of the Senate received pay raises of as much as \$5,000 a year.

At the same time both the House and the Senate passed bills greatly restricting the type of information any employee of the Government may supply to those whose business it is to distribute it. And in order to further restrict the distribution of information the Congress arranged to send out five and one-half pages of questions asking all Federal Executives and independent agencies to explain their practices and policies in giving out information.

The End



FASTER DELIVERY on Both SPECIAL and STOCK DIE SETS

Now...you can get into production faster with a Detroit special or standard die set. First, because of our greatly expanded facilities, we are now making delivery in less time. For instance, a standard die set will be shipped within 24 hours; specials in remarkably short time. Second, because every full-value Detroit die set is built up to our high standard and not down to a price and is factory-tested to specifications. Such precision gives you faster mounting without the delay and cost of reworking the set in your shop. Why not talk things over with our nearby representative? Write today.



"full value"

means that in a special or standard Detroit die set you get what you pay for . . . the exact, specified thickness of both die holder and punch holder, true parallelism of surfaces, precision fit of pins and bushings—all assured by precision manufacture, factory assembly and factory inspection.



2895 W. GRAND BOULEVARD • DETROIT 2, MICHIGAN
Offices in Principal Industrial Centers

a Completely New Machine— designed especially for BORING AND MILLING SMALL PIECES for PRODUCTION WORK or ONE-PIECE JOBS

THE MODEL 2B-36
DE VLIEG SPIRAMATIC JIGMIL



WRITE FOR ILLUSTRATED CATALOG

DEVLIEG MACHINE COMPANY

450 Fair Ave., Ferndale . Detroit 20, Michigan



of Thought in Industry

An Interview with D. J. Davis, Vice-President — Manufacturing, Ford Motor Company

Q. Would you explain some of your manufacturing problems and how you are solving them? For instance, how do you determine whether to buy or make components which are available from outside companies?

A. Our manufacturing problem relative to the 'make or buy' pattern for components can be divided into four items:

- a. Those components which are designated captive and would be manufactured by Ford Motor. This is dictated by company policy. A few of these items are cylinder blocks, cylinder heads, rear axles and automobile bodies.
- Those components which can be manufactured either by the company or by an outside source, the

manufacturing source being determined by competitive bidding. The lowest bidder is the designated source.

- c. Those components which by their nature are special, such as tires, spark plugs, batteries and many others, too numerous to mention.
- d. Those components, which because of company agreement with outside suppliers, are so-called split items, of which a certain percentage is manufactured by Ford Motor, the remainder by the outside source. Examples are automatic and standard transmissions.

Q. Do you have some sort of a cost analysis program? If so, would you explain how it operates, its effectiveness

Interview . . .

in reducing production costs and other benefits?

A. We have such a program at Ford Motor. There is a central activity which controls all financial transactions in the company. Close liaison is maintained between the Controllers' Offices and the Central Finance Staff Office. Actual costs of all manufactured articles are shown against budgeted costs and these reports are analyzed. Areas where costs are greater than budgeted for manufacturing get special attention from various staff offices as applicable in order to reconcile the cost differentials.

Special cost analysis reports are compiled on new and proposed manufacturing processes for new or current parts which are used as guides by Manufacturing and Product Engineering.

Q. How do you purchase machine tools? Is it done by a central pool or does each division buy independently?

A. Purchasing of machine tools is accomplished by a Central Staff Purchasing activity. Manufacturing divisions have, on occasion, purchased their own machine tools, but always under supervision of the Central Staff.

In the future, it is expected all such purchasing will be by Central Staff Activity.

Q. How do you purchase your perishable tools? Is it done at the foreman, purchasing agent or superintendent level?

A. All perishable tools are purchased by a designated purchasing agent, upon written request of the manufacturing activity using such tools.

Q. How does your replacement program operate?

A. In the past, our replacement program was based on:

a. Obsolescence.

b. Machines worn out.

c. Product design changes.

d. New machines with greater productivity becoming available.

In the future, in this highly competitive automobile market, our replacement programs will be tied in more and more with product design. Competition will dictate the trend of product design changes which, if extensive and frequent, would force replacement of machines and equipment more often than in the past.

We, at Ford Motor, are endeavoring to promote a standardization of components of transfer straight-in-line machines, components such as main base, side wing base, transfer mechanism and power units. This will minimize cost, and because of the standardization, will materially reduce time required to change over our large machines for new car model programs.

Q. I understand that there is an everincreasing demand for automatic controls for machinery. Have you felt this demand, and do you think it will continue to increase?



D. J. Davis, vice president—manufacturing, Ford Motor Company, is the staff executive directing activities of the manufacturing engineering office, the plant engineering office, the office of quality control and the office of general traffic.

Mr. Davis also is chairman of the manufacturing committee and a member of the administration and industrial relations committees,

He joined Ford in 1949 as director of the manufacturing engineering office and was elected to his present position on January 25, 1955.

Mr. Davis was born in Detroit on April 8, 1902, and began his association with the automotive industry in 1922 when he joined the Cadillac Division of General Motors Corporation. During his 21 years with the Cadillac Division, he held various executive staff positions in the production engineering department.

He joined the Avco Corporation in 1942 as master mechanic of the American Propeller Corporation of Toledo, O. In 1944, he became chief designing engineer of the firm's postwar products and later was made staff master mechanic in charge of product manufacturing for Avco's plants.

During 1946, Mr. Davis was the operating head of Avco's Lycoming Division and in 1947, he became chief industrial engineer of the Avco Corporation, his last post before joining Ford.

A. There is a greater demand than ever before for automatic controls for machinery. We, as extensive purchasers of all types of machinery, both metal forming and metal removing, have contributed to that demand as we use it wherever possible on our machines. As industry in general and the automotive industry in particular expand to meet the ever-growing demands of the public for manufactured goods, the need of automatic controls must of a necessity keep pace with the industrial expansion and continued process improvement.

Q. Would you explain to some degree how much your company is involved in the manufacture of automatic equipment? A. We are not involved in the direct manufacture of automatic equipment but, in cooperation with machine tool builders, have been instrumental in the furtherance of technological development in this field, as we use this type of equipment throughout our company.

Q. Have you introduced to any great extent automatic machines in your manufacturing operations which could be considered part of an automation program?

A. Yes, we have introduced automatic machines in quite a number of our manufacturing plants, notably our engine plants in Dearborn and Cleveland; in our valve manufacturing at Milford; in our stamping plants at Buffalo, Dear-

Interview . . .

born, and Cleveland, and in our general manufacturing plants.

These machines, because of their design, such as the transfer straight-inline machine, lend themselves very readily to automation, coupling many machines of different makes; that is one manufacturer's machine can be coupled with a machine from another manufacturer and this can be repeated, giving in effect one complete machine.

Q. Do you have any views on the tapecontrolled type of machine tools? Do you think they will ever be generally available from the economic standpoint?

A. We have in the past investigated the possibility of using the tape-controlled type of machine more particularly in the manufacture of metal patterns and stamping dies. At the time of the investigation covering metal patterns and stamping dies, it was felt that Ford Motor had many other types of duplicating machines and die sinkers and were adequately covered. The foregoing naturally applies to tool room and pattern shop custom operations.

We at Ford Motor have yet applied tape control to production machines, but who knows, with the rapid changes in the technological picture, we could be using tape-controlled machines sooner than we expect. Naturally, this would only apply if there was an economic advantage to us. We are keeping abreast of new developments, but have no immediate practical applications.

Q. Do you believe in sharing the results of your general research with industry? How does your research program operate: is it a part of your production division, or is it operated independently?

A. We believe in sharing our general research results with industry as a whole; however, there are certain items which we feel, because of the time and investment we have in them, should return certain benefits to us before disclosing our findings. Our research work in manufacturing is a Central Staff function performed by a department of the Manufacturing Engineering Office, Manufacturing Staff, However, as many of our programs in manufacturing research are sponsored by one or another of the manufacturing activities, such programs become a joint responsibility with Staff and Manufacturing working as a team.

Q. What do you think is the most pressing problem facing industry today, and how do you think it can be overcome?

A. While we have many problems in a company as large as this, such as product design and its necessary modification to suit manufacturing feasibility and the manufacturing of products to meet public introduction dates, we feel that labor relations is the paramount one. Dealing with individuals presents many varied and complex problems to which we do not always have the answers.

Interview . . .

Q. What is the business outlook for your industry, aside from government work?

A. The automotive industry in the year 1956 from all indications should have a very prosperous time. The number of two-car families is on the increase, no doubt caused in some measure by the ever-increasing number of working wives. Of course, in families where there are a number of adult sons and daughters and the present day trend of our youth in demanding and in many cases getting cars of their own, we may even have in 1956 as many as three and four-car families.

Yes, 1956 looks like another banner year.

Q. There is some talk that the smaller business finds it difficult to operate. What advice do you give smaller companies wanting to remain in the competitive market?

A. A small business wishing to remain in the competitive market would be well-advised to manufacture items of which it has a particular knowledge and a good manufacturing technique. The small business should keep its overhead and its investment in facilities, machine tools, equipment, etc., to a minimum and must watch manufacturing costs. Whenever the costs begin to rise, if not covered by a corresponding rise in the piece price, do something about it. The old maxim, 'The best possible product at the least possible price' should be the watchword of small business.

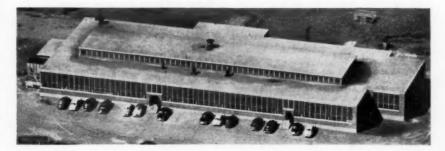
The End

New Hack Saw Plant for American Saw Co.

The Amercan Saw & Mfg. Co., has recently begun operation of a new hack saw producing plant at East Longmeadow, Massachusetts.

The plant is a modern one-story building organized around a new

straight line production system. Steel for the hack saw blades enters at one end of the plant and moves continuously through the series of production, heat treatment, and inspection steps to the stock facilities at the other end of the plant.





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PRINCIPAL PRODUCTS: BARS, STRUCTURALS, PLATES, SHEETS, TUBING, ALLOY STEEL, STAINLESS, ETC.

completely unbiased recommendations when you consult Ryerson specialists on tubing problems. Another advantage of Ryerson tubing service: You can save time by ordering every other steel requirement from the same source.

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JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA CHARLOTTE, N. C. • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Stop Tool Damage, Theft and Hoarding With Tool Control System

By T. F. Dunton.

Supt., Perishable Tools & Supplies, Machinery & Systems Div., Carrier Corp., Syracuse, N.Y. THERE is no place in the high production machine shops of today, or of the future, for the hit-or-miss method of tool control that has been tolerated in the past. The greater variety of perishable tools used in our modern manufacturing methods has made it necessary to set up a comprehensive system, whereby such tools may be made available at a moment's notice and replacements are issued according to usage.

Perhaps no better illustration of the importance of tool control can be cited than in the fact that a large number of manufacturers, after filling defense contracts or receiving cancellations found themselves with a huge excess of perishable tools to be disposed of at the best price they could obtain. Furthermore, because of lack of tool control, in many instances, an artificial shortage was created, literally hamstringing our war production effort.

The single purpose of making available to

Tool Control . . .



This is another of the company's cribs. It is easy to see how quickly a tool inventory could be handled.

the worker at a moment's notice needed tools and supplies is not sufficient. In order to be in keeping with modern industry, the system must go far beyond this single objective in saving operating dollars and in making manufacturing sense.

By fixing definite responsibility, the right kind of system will reduce losses of tools by theft and damage. It will also be a means of reducing inventory costs by preventing hoarding.

It can be used to check whether or not each operator has received certain required safety equipment. It supplies records on the operating efficiencies of individual machine operators, and provides comparative performance data on various kinds and makes of tools. It helps establish economical tool standardization. It often discloses common troubles with tools, and thus opens the way for proper remedies.

A sound effective system can also be a means of safeguarding against continued use of faulty or work-weakened tools. It also provides a method of tool recall before the tool is too far gone for economical repair, and has become a safety hazard. It keeps the tool investment down to an efficiently workable minimum.

A sub-tool crib system is used with the Master Crib acting as the hub of the wheel in its job of procurement, distribution and control of tools and supplies. Because of the size of our

THIS TOOL PROGRAM WILL:

- fix definite tool use responsibility
- reduce losses by theft, damage & hoarding
- record individual tool performance
- · establish basis for tool standardization
- check operator's efficiency
- permit fast salvage of repairable tools
- insure safe condition of tools
- · hold tool expenditures to a minimum
- · check workers' possession of safety supplies
- · disclose operational difficulties with tools





Two views of the Carrier Corp., main tool crib. All tools are sorted and marked and are easily accessible.

October, 1955

Tool Control . . .

P-61₀ 2-53 Carrier Corporation SYRACUSE, N. Y.

TOOL ORDER

No. 916103

Operators must fill out in triplicate this form before obtaining tools.

WORKMAN NOTE. THESE TOOLS ARE IN YOUR CHARGE UNTIL RETURNED. IF LOST THEY WILL BE CHARGED TO YOU. KEEP THIS SLIP UNTIL TOOLS ARE RETURNED THEN EXCHANGE FOR YOUR ORIGINAL WHITE RECEIPTED SLIP.

Received by_

operation, a master crib annex is necessary to handle bulky and heavy supplies. In conjunction with the Master Crib, nine (9) sub-tool cribs are strategically located, one in each manufacturing division—thus keeping pedestrian traffic at a minimum. Each crib carries all the standard items normally required by the division. In this way, a sub-crib can specialize in handling tools and supplies needed for performing the work in that production group. The tool crib serving our tool room also acts as a steel storage and dispersing crib since our tool room uses many special steels. Three other cribs are established—one for checking, storing, and dispensing dies-one for storing and dispensing jigs and fixtures one for storing and dispensing oils, lubricants, paints and cleaning materials.

To clarify this system, the following

is a list of cribs and the location of

each.	
BLDG.	CRIB
TR1	Master tool crib
TR1	Master tool crib annex
TR1	Die room crib
TR1	Oil room crib
TR1	Jig and Fixture crib
	SUB CRIBS
TR1	Tool crib No. 1
TR1	Tool crib No. 2
TR1	Tool crib No. 3
TR1	Tool crib No. 5
TR2	Tool crib No. 7
TR2	Tool crib No. 8
TR3	Tool crib No. 4
TR4	Tool crib No. 9
TR6	Tool crib No. 6

from Sub-Cribs Withdrawals

When the operator requests cutting tools or precision tools, gages, or blueprints, a tool check is made out in

Tool Control . . .

Porm P-91(1	PC) 0-4R	CAR	RISH COMPO	RATION Toro				
MERELY DEPRCTIVE TOOL REPORT								
PROM TO DIV, LOCATION								
QFT.	OF TOOL	MPGR.	DATE	CHECK NO.	MONRAGE 'S NAME	mpr.	DEFECT	0 000
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The operator must provide a complete record of tool performance on this form.

triplicate describing all the tools requested. The worker acknowledges receipt of the tool by signing the check.

The first copy of the Tool Check, and often the second as well, go up on the tool board which is of the spring clip type. If a valuable tool is issued, or if the tool is likely to be kept for some time, the second copy is spring clipped to the rack of the bin which held the tool.

When the tool is returned to the sub-crib, all copies of the tool check are destroyed. In the case of a broken or damaged tool, the worker may obtain a new one upon return to the sub-crib of the worn or broken tool, plus an authorized requisition to do so. This gives the authorized person the opportunity to examine the broken or worn tool to ascertain if it is method, man or tool at fault, before issuing replacement requisition.

In order that the tool crib attendant will know whose signature on requisitions to honor, the department is supplied from time to time with a list

		CARLIER CO SYRACUSE	NEW YORK			
		Phonuction 8	EUE PRINT RE	PORT		
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	1		1			

A blue print report must be filed by the crib attendants to prevent any changes in specifications.

of the persons authorized to requisition tools and supplies.

Defective Tool Report

A full description of the tool, price and the defect with the operator's clock number is entered on our defective tool record, thus giving us a complete record of the performance of the tool. This record is priced and sent to the division superintendent weekly.

The sub-crib sends the broken and worn tools to the Master Crib, accompanied by a material requisition for replacement. The Material Requisition also serves as a movement in the designation of costs of the tools.

The quantity of tools and supplies stocked in the master tool crib are scrutinized daily when requisitions are being filled. When the stock of any item gets low, the Master tool crib foreman makes out a purchase requisition in four copies, all copies go to the Superintendent of Perishable Tools where the Superintendent approves the order, if acceptable, and retains one copy. The original and two copies go

to the purchasing department, which forwards to the record division of Tools and Supplies thus he has a record of the placement of the order and the promised date of delivery. A daily check of all orders can thus be made for follow-up purposes.

When the ordered material enters the plant it is received by our receiving department and written up on a receiving report. A copy of the receiving report is sent, with the material, to the Master Crib where it is thoroughly checked and dispersed. The records are then filed away. Many of our tools go first to the Inspection Department and then to the Master Crib.

Lost Tool Report

Every two months a complete check is made of all perishable tools, gages, and blue prints issued. Tools are returned, and if needed, reissued. If, however, the operator cannot account for all the tools, a lost tool report is made out giving a full description and the tool's price, and the operator responsible. This is submitted to the

Tool Control . . .

Pre Principle	● rgr	**	OOL INVENTORY				
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B. Vallla	8132	MANUFACTURES	DESCRIPTION	CHREA 9	O. DAYE	VALUE	
			0-6-57				
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						-	

This lost tool report must be submitted every two months by each operator.

division superintendent for him to take any action he may consider necessary. At the same time a copy of the tool check is filed away in an envelope against this man's tool record in his tool crib for further scrutiny if the employee should leave the company.

Ordering New Tools

Requests for new tools or items not carried in stock may originate in the shop. The foreman makes out a plant requisition countersigned by the division superintendent, which is forwarded to the Superintendent of Tools and Supplies. If the request comes from Tool Design or Methods for new or revised manufacturing operations, the desired tools usually appear on an Operation Sheet.

Tools and Supplies checks over the tools on the Operation Sheets, and

if an item is carried in stock, the Master Crib supply of these tools may be increased. If no Carrier standard tool is satisfactory, new tools are authorized for purchase in a manner similar to that for replacing stock items. The quantity of new kinds of tools ordered, other than those carried in stock, is relatively small because standard tools already adapted are used wherever possible.

Safety Check

The tool control system also acts as a check on some of the safety measures practiced in the plant. From the records it can be determined whether or not a worker has withdrawn such safety supplies as goggles. Another safety precaution is that all tools held by each operator are turned in every two months for inspection and replacement if defective or worn out or otherwise faulty.

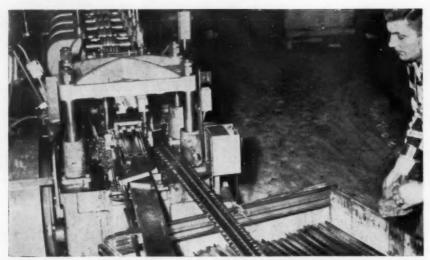


Figure 1.—Strips ready formed being discharged automatically into a tote box from the rolls in the background. In the foreground is the flying cutoff and a shaft that reciprocates and is rocked to eject each strip.

How . . . Rolls Do Fast Job of Converting

by L. Eichler, Superintendent Tool Room & Machine Maintenance, Whirlpool Corp., St. Joseph, Mich.

STEEL panels 32" long and 4-3/16" wide, embodying a set of five parallel channel-like beads and with a double fold along each outer edge, are required in large volume for home laundry equipment manufactured by Whirlpool Corporation, St. Joseph, Mich. Until recently, these panels, made virtually without waste from steel strip 0.035" thick and 6" wide, were purchased from an outside supplier.

Investigation indicated large savings in cost per piece if a nine-station Yoder roll machine in combination with a flying cutoff were installed. Accordingly, this equipment was purchased and its use has brought savings sufficient to amortize cost quickly.

Figure 1 shows the feed end of the stand where coiled stock is drawn into the rolls and figure 2 illustrates the delivery end that includes the cutoff

and a rocking ejector that automatically shunts strips into a tote box as rapidly as they are cut off. Rolls are so designed and set that they produce three raised parallel channel shaped beads on one side of the strip, the three alternating with two similar depressions that appear raised on the opposite face. Outer legs of each outer channel are made double thickness by folding the metal back upon itself so that no exposed sharp edges remain.

Rolling is done at the rate of 80" a minute and is continuous, as the flying cutoff is picked up and travels at rolling speed until it severs the stock, is then released and moves back in time



Figure 2.—Stand including nine sets of Yoder rolls that convert coil stock into formed strips having parallel channel-like beads. Feed is from the end in the foreground to a flying cutoff at the far end.

Coiled Strip into Beaded Panels

to be picked up and make the next cut. At one edge of the narrow runout bed, there is a reciprocating shaft carrying a knockout that is rocked at intervals by a solenoid when the end of the shaft trips a limit switch. This rocking is timed so that each piece cut off is deflected into a tote box without being touched by hand.

Actually, the entire setup is automatic and, once set to run properly, requires no attention save an occasional check by the operator to see that functioning continues as required. When a coil runs out, of course, the machine is stopped until a new coil is put in place and is started through the rolls. Total output while running is 1200 strips an hour and, as this is much higher than for most other components of the equipment in which the strips are used, the rolls need run only a part of each day to supply the necessary quota of strips.

The End

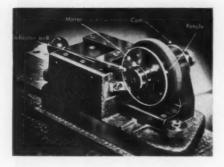
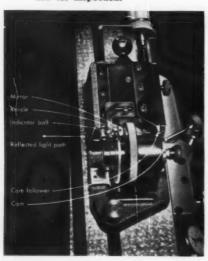


Figure 1. Side view of fixture showing sides that face projector.

"Bouncing Ball" Method of Indication

Figure 2. Top view of fixture with cam and reticle in position for inspection.



THE inspection of irregular cam contours is generally difficult for even the most seasoned inspector. To check cam contours quickly and accurately, Optical Gaging Products, Inc., Rochester, N.Y., has produced a method for the optical gaging of these contours.

Using the intense light of the surface illuminator of the Kodak Contour Projector, this optical gaging method permits inspection of cams mounted as they will be held in assembly. Basically, the method is simple. It may be likened to a "bouncing ball" method of indication. The cam is mounted on an arbor which may be turned by hand. Turning the cam actuates a follower which carries with it an indicator ball. How closely that indicator follows tolerance lines, also rotating with the

Optical Gaging Method Provides:

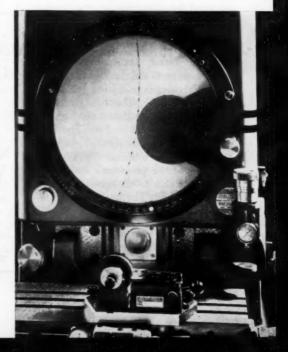
- · quick and accurate inspection
- · low cost
- · every point gets immediate check
- .0005 tolerance inspected in 40 seconds

Inspects Irregular Cam Contours

cam, may be readily watched in the projector screen at a large magnification. The following paragraphs get into the inspection arrangement in short detail.

The cam to be checked is mounted on an arbor of the staging fixture. The staging fixture is simple in appearance and in operation. In adjustable Y-type voke carries two followers. One is a precision hard-ened steel ball which is spring-loaded to follow the contour of the cam itself. The other is a flattened circular indicator. This faithfully duplicates the motion of the follower on the cam contour. The cam to be checked is mounted on an

Figure 3. Image of indicator ball within projected tolerance lines immediately proves this dimension of cam satisfactory.



axis common with a glass reticle. The cam is on the operator's end of the axis. The tolerance-carrying reticle is mounted on the Projector end of that axis. The motion of the reticle throughout inspection procedure is identical to the motion of the cam. (See Figure 1). The reticle is a precise actual size reproduction on glass of the contour and tolerance lines, as specified on the cam drawing. The reticle may be quickly replaced. Tolerance and contour revision may be incorporated in replacement reticles.

How does the image of the indicator ball get to the screen? First, note that the light source is the surface illuminator. A feature of the Kodak Contour Projector which makes this method possible is the effective location of the surface illuminator on the optical axis, within the cabinet of the Projector. Briefly, the light rays issue from the projector toward the operator, but are returned by a mirror on the staging fixture to the projector's optical system, carrying with them the images seen on the screen. (See Figures 2 and 4). In more detail: Incorporated in the staging fixture, on the operator's side of the reticle, is a mirror facing the contour projector. The light from the surface illuminator passes through the glass reticle to this mirror. The light is then reflected back through the glass, past the black tolerance lines of the reticle, into the projector's optical system and so on to the viewing screen. (See Figure 3). The images of the tolerance lines and indicator ball are thus projected onto the screen at any selected magnification. Initially, the cam and the reticle are brought into complete coordination as far as angular and

radial location of a starting check point is concerned. This is accomplished by making adjustments so that the image of the indicator ball is tangent with the image of a "set-line" when the setmaster provides a V-notch for positive location of a cam follower ball at an initial reference point specified on the part drawing. Adjustments are provided to lock the setup securely in position. The set-master cam is then replaced with an actual cam, and the checking procedure may proceed for all points around the periphery of the cam. The spring-loaded follower ball traces the contour of the cam, and the indicator ball on the reticle side will accurately follow its position in relation to the master reticle being projected on the screen. Figure 3 shows the tolerance and cam contour lines and the indicator ball shadow on the screen of the projector.



Often the tolerances of cam contours are called out at only specified angular intervals; in this case, at one-half degree intervals. In addition, the total tolerance for any one check point may vary from the total tolerance of another check point. These variations in tolerance along the contour of the cam are accurately reproduced on the reticle glass. The cam contour is drawn through all the variable tolerances at all locations. So, actually, every point along the contour gets an immediate visual check. Thus, not 720 points, at a one-half degree interval along the contour, but an infinite number of points are checked in this manner. Any pits, blemishes, tool marks, and scratches of any nature, which may throw intermediate points out of tolerance are indicated positively on the viewing screen.

Previous inspection of these cams, with tolerances as close as .0005", reugired 13 hours per cam for inspection

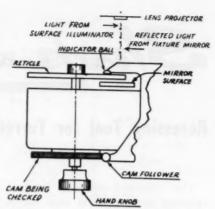


Figure 4. Schematic drawing of fixture from the top.

by an experienced inspector. The Optical Gaging method has reduced this to inspection of the entire contour within 40 seconds (with an inexperienced operator). With this method there is no wear problem, nor are there any difficult adjustments to make.

Effects of 1954 Revenue Act To Be Evaluated

Senator James O. Eastland (D., Miss.) is Chairman of the Subcommittee on Taxes. His group will evaluate effects of the 1954 Revenue Act on small business.

Sen. Long Heads Monopoly Subcommittee

Senator Russell B. Long, (D., La.) is Chairman of the Monopoly Subcommittee. His group is expected to do something about the enforcement of the Robinson-Patman Act, mergers and increasing concentration within industry on small business. Senator Hubert H. Humphrey (D., Minn.) has a group expected to do something about the New Jersey gasoline price wars; the current status of fair-trade laws and the operations of discount houses, and the harm of cross-couponing on small business.

The full Committee is charged with holding hearings on the operations of the Small Business Administration and probable changes in its authority; and with policing the expected Report of the Attorney General's National Committee on the anti-trust laws.

The End

Shop HINTS

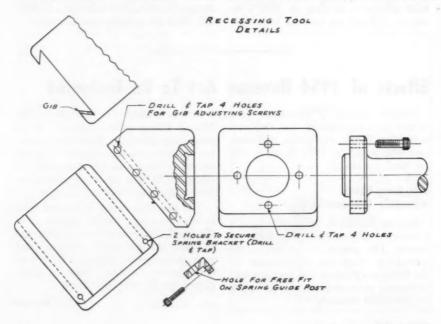


Recessing Tool for Turret Lathe

by H. J. Gerber

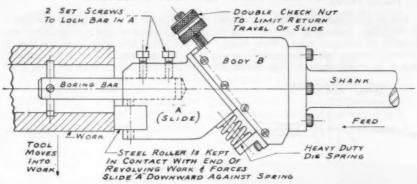
The illustrated adjustable internal recessing tool for turret lathe use is practical and trouble free.

The tool consists basically of a dovetail slide, A, held at a 45° angle in body B. A hardened steel roller set into A contacts the outer face surface of the rotating work and moves the slide downward as the pressure is exerted against it by the turret feed. This downward movement feeds the cutting tool to desired depth. The depth of cut is controlled by the usual turret station stop which controls the axial movement of the tool. When axial feed pressure is released the slide is returned to out position by a heavy duty die spring



Shop Hints

RECESSING TOOL FOR TURRET LATHE

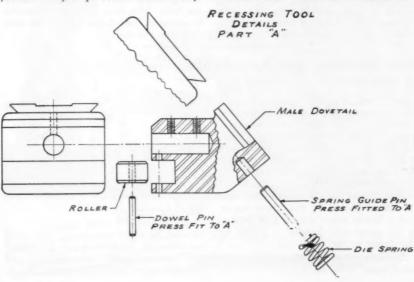


fitted to the lower side of A and retained by the bracket on B and the rod fitted to a hole in A.

An adjustable check nut fitted to the stud on top of **B** will control the extent of disengaging movement of slide **A.** The simple boring bar can be adjusted axially to place the recess at any

desired distance from the face surface of the work.

It may seem, at first sight, that the an angle corresponding to the angle of the slide. This situation will not be possible as long as the roller is in concutting tool will advance to depth at stant contact with the face of the work.

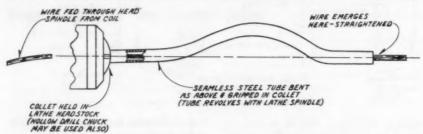


Wire Straightening Device

Shop Hints . . .

by Harold Franke

In the manufacture of wire products it is often necessary to have short lengths of straight wire. Wire taken directly from a coil is not suitable unless it is straightened by some means. then gripped in a collet or hollow spindle drill chuck on the head spindle nose of the lathe. The wire from the coil is fed through the hollow lathe spindle and is drawn out through the bent tube



The illustrated device will do an efficient job of straightening and may be made up and put to use in a very short time. The device may be mounted on any small engine lathe which is equipped with collets or self-centering chuck.

A piece of seamless steel tubing, which has an inside diameter just slightly larger than the diameter of the wire, is bent as illustrated. The tube is as it is revolving in the lathe. The lengths of wire may be gaged by some suitable means and cut off as they emerge or the wire may be led out to an adjacent cutting table for measuring and cutting. Wire should be lubricated with grease or heavy oil before it enters the tube. This may be easily done by brushing on the lubricant while the wire is still in the coil.

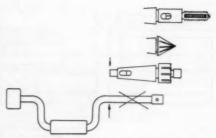
Hand Spotfacing Tool Saves Setups

by Frank Schneller

Occasionally, in the repair or rework due to engineering changes, it becomes necessary to spotface some holes on large fixtures. Rather than move these fixtures to a large machine and make a time consuming setup, we devised the pictured hand spot facer out of a standard speed drill.

The driver of the speed drill was cut off as shown by the lower arrow and a Morse taper sleeve was welded to the speed drill handle as shown by the upper arrow.

Standard, piloted spotfacers (counterbores) can then be inserted into the



tapered hole of the sleeve. This tool can also be used to great advantage for countersinking (chamfering) and for cleaning of previously tapped holes.

EACH MACHINIST BEGOMES A

ONE MAN CREW

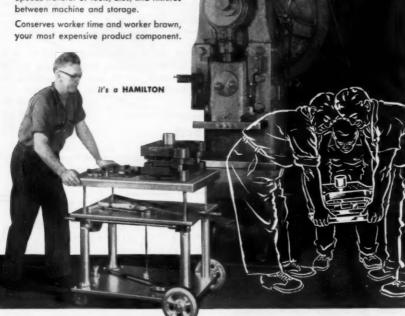
ORTELVATOR

One man can lift, lower, and transport compact, heavy loads which, without Portelvator, would require the combined strength of three or more men.

Maintains materials at proper machine feeding level.

Speeds transfer of tools, dies, and fixtures between machine and storage.

Reduces injuries to workmen, and damage to tools and materials due to manual handling. Provides a portable work bench when and where required.



WANT MORE FACTS? Write for FREE Hamilton Bulletin No. 5346. Address The Hamilton Tool Company, 826 South Ninth Street, Hamilton, Ohio

WITH CONFIDENC

Encircle No. 330 on Card, Opposite Page 65

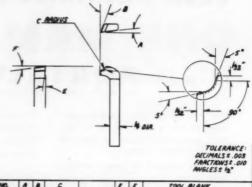
ID Radius Tools

by Harold D. Rhodenbaugh

In small parts fabrication on lathes and hand screw machines, delicate or touchy little problems of radii arise repeatedly to plague the operator or tool supervisor. This is especially true when the required radii are minus 1/32", and are specified in decimals with a plus or minus .003.

A tabulated internal radius tool chart is shown. These tools are made from Armstrong forged boring tool blanks. They are stocked and maintained as standard radius tools.

The sectional view demonstrates a method of grinding that will facilitate the radius forming operation and will minimize the hazard of cutting steps at the flare-out of the radius. This style Shop Hints . . .



> of tool can be used either in a tool block or square turret when set in a V-block, or it can be mounted in a vertical slide on the hex-turret.

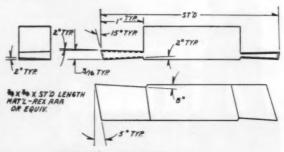
The Old Tools Are Sometimes Best

by Henry Stevenson

The cutoff or parting tool is probably as old as the first machine that could use one. There are many new versions of this old tool and many of these are good. But the old cutoff tool has the distinction of being easy to make and quick to replace. Its clearance angles and rakes can easily be altered to re-

quirements, which is a factor to reckon with in job shops, or shops using various materials such as aluminum, stainless steel, 8620, 4140, 6150, etc.

Illustration shows how to make up these cutoff tools for production appli-



DOUBLE END CUTOFF TOOL

cation. By grinding a double end cutoff tool, the cost of changing tools is greatly reduced. In a sense, it is a "twoin-one" tool, simple but worthy of consideration.



There is no way under the sun to do small, precision tapping with "production" speed, satisfactory tap life and acceptable accuracy, other than to use a tool designed for the specific purpose.

THE Hamilton SUPER-SENSITIVE SMALL HOLE TAPPING MACHINE IS SUCH A TOOL!

WANT ALL THE FACTS

Write for Hamilton Bulletin No. 5203. Address The Hamilton Tool Company, 826 South Ninth Street, Hamilton, Ohio.



Encircle No. 331 on Card, Opposite Page 65

Shallow Hole Boring

by A. K. Walter

Shop Hints . . .

Let us presume that you are struggling with the problem of supplying boring tools or quills for shallow hole boring. You have hunted the tool catalogs through and through and do not find that range of boring tools designed for your particular and immediate boring needs. The bars listed are too long, too large in diameter, or have built-in characteristics forbidding application of your own tool geometry, or the price may be bevond the range of your tooling budget.

Illustrated is a step

forward in the solution of this problem. Approximate cost of building this bar is \$3. Carbide blanks for the tool bits may be in your stock right now. If not, they should be. The cost of these carbide blanks range from 30c up to \$1 each, depending on size. In applying your own tool grinding geometry and know-how you can have bits ground

1	TAP(2) B32 HOLES
.140	
6 11	
MATL: MACHINE STEEL	SE'X45 CHAMF BOTH ENDS

BORING QUILL								
TOOL NO.	A	8	C	0	E	F	G	
BM 2310	2"	1"	.5002 -5005	.062	196	3/16	\$32	
BM 23//	3"	1"	.5002-5005	.062	1/16	3/16	\$/32	
BN 25/2	4"	1"	.5002-5005	.062	46	3/16	5/32	
BM 23/3	5"	1"	.5002-5005	.062	46	3/16	5/32	

for aluminum, stainless steel, nitralloy, investment castings, etc.

This quill is especially adaptable to micro-adjustment boring heads having a maximum bore depth of 1¼". Because of their simplicity of design and negligible cost, they can be made and stocked in quantities, in ranges to your requirements.

How to Renovate Files

By Fred Strauss

There are a few methods for renovating files which have become dull: mechanical, electrical and chemical.

While the first two require special knowledge and equipment, the third one is quite apt for domestic utilization. The process is simple, cheap and doesn't require special equipment.

Leave the files for a couple of hours in a 10% solution of sulphuric acid (1 part acid and 9 parts water) with perhaps an addition of 1-2% nitric acid. (Be very careful in the preparation of the solution: pour always the acid into the water, never vice versa!)

Wash the files thoroughly in running water. Now dip them in milk of chalk (in order to neutralize any trace of acid which may remain between the teeth). Then wash off the lime.

Dry the files by very slow heat. Finally lubricate them lightly with a very light kerosene or a mixture of olive oil and turpentine.

CUT COST OF PRECISION GEAR PRODUCTION

THIS FEATURE: "Independent selection of speed, feed and indexing," sets the Hamilton Precision Small Gear Hobber apart from the field.

AND ENABLES the users of this machine to. vary speed and feed to suit the material being machined.

THIS FACT, and a "reserve of accuracy" built into the machine, work spindle and hob spindle runout of less than .0002" as an example,

CONTRIBUTES to more gear precision with no sacrifice of gear production,

OR INCREASED gear production with no sacrifice of gear precision, OR BOTH!

Prices and specifications without obligation

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Address

The Hamilton Tool Company 826 South Ninth Street Hamilton, Ohio

IT'S A

Encircle No. 332 on Card, Opposite Page 65



Unusual Turret Lathe Machining Device Developed

An ingenious turret lathe machining device which permits angular cutting on the face of a bilge pump impeller has recently proven its worth. The new device has increased production 50%, while virtually eliminating breakage caused by the former facing method using a skiving tool.

A roller-follower is mounted opposite the cutting tool on the cross-slide. Leaving the cross-slide unlocked allows the proper cutting angle to be determined by the pressure of the roller-follower as it travels across a concave cam-disc locked in the turret.

The pump impeller, made from a phosphor-bronze casting, is machined to a tolerance of .0015" with a six-degree angle on the face. The pump is used in the Army's water-going M59 armored personnel carrier, designed and produced by Food Machinery and Che-

Cutting tool has just machined a six-degree angle on the face of the pump impeller used in bilge pump for an M59 armored infantry vehicle,



While turret lathe's cross-slide is allowed to "float," cutting tool is guided by the roller-follower pressure against this concave cam-disc.



for rounding . chamfering . pointing . burring

Greater Flexibility with Cross Gear Machines

NO. 75

For burning or chamfering both ends at the

helical gears · spiral bevel pinions hypoid pinions

Typical production - chamfering 8 pitch 40

tooth gears - 200 net hourly



For rounding, pointing, chamtering or burn ing external and internal-

spur gears a helical gears

Typical production—rounding or pointing 8 pitch 30 tooth gears-55 net hourly

NO 65

For pointing or chamfering external and

clutches . spur gears bevel gears . splines Typical production—painting 10 pitch 30 tooth gears - 100 net hourly

- * Flexibility for handling a wide variety of
- Rugged, heavy duty construction for continuous high production or job shop oper-
- * Short setup time (as little as 15 minutes) for changing from one gear to another.
- * Simple, inexpensive tooling.
- * Push button controlled automatic cycle.
- * Hydraulic power work clamping.

For mass production or short run jobbing operations, there is a Cross Gear Machine to suit your requirements.

Encircle No. 1A on Card, Opposite Page 65

CO

Established 1898

MACHINE TOOLS





times longer life. Use "SAND SCREEN" "SAND SCREEN'S" unique open-mesh sides are usable—give you 7 to 15 construction lets removed material flow right through...instead of loading or glazing, like conventional paper and cloth. What's more, both

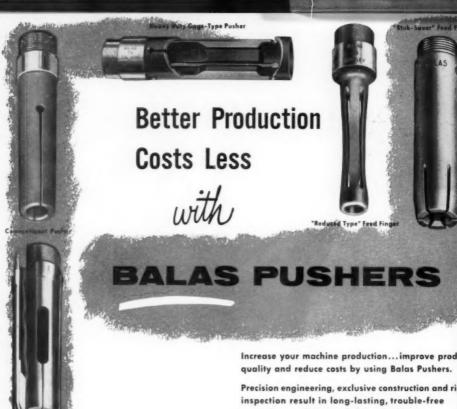
wet or dry, by hand or machine. It tears and folds easily to any desired size. Cut sheets fit oscillating or Discs give best results when used wet with CARBORUNDUM'S FASTCUT® Pad 85 Assembly. Try it-see how it vibrating machines. "SAND SCREEN"

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Increase your machine production...improve produc

Precision engineering, exclusive construction and rigid operation on all types of screw machines and lathes. Balas Pushers are made from oil hardened, non-warping tool steel...properly hardened and correctly tensioned for maximum feeding efficiency and reduced stock waste.

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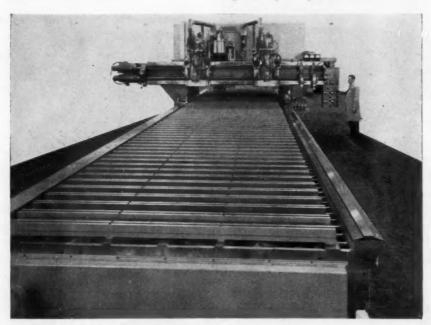
REPRESENTATIVES: George Britton, Brockport, N.Y.; Bert Lewyn, Atlanta, Ga.; L. R. Christiansen Co., Moline, III.; Eugene H. Cooper Co., Hopkins, Minn.; Tri-Tex Machine & Tool Co., Houston, Tex.; Coast Tool Co., Ookland, Calif.; Machine Tool & Supply Co., Tulsa, Okla.; Harris Frederic & Co., Shreveport, La.; Fuchs Machinery & Supply, Omaha, Neb.; Hoffman Baumruck Co., Philadelphia, Pa.; Hunker & Dixon, Indianapolis, Ind.; Harvey A. Wolff, Milwaukee, Wis.; S. B. Martin Co., Cleveland, Ohio; Morris Machinery Co., Newark, N.J.; Paul & Dudley, Glendale, Calif.; John S. Pettif, Madison, Conn.; L. E. Rogers Co., Chicago, III.; Scott Special Tools, St. Louis, Mo.; Shively Bros., Inc., Flint, Mich.; Tool Specialists, Westbury, N.Y.; Arthur Williams, Beaverton, Ore.; Iver J. Esbenson Co., Denver, Colo.; T. M. Welborn Co., Greenville, S. C.; A. C. Behringer, Inc., Los Angeles, Calif.; Alexander & Orlick, Ltd., Brantford, Ontario; Upton, Bradeen & James, Montreal, Canada.

Milling Machine Does Work of Three

This A-72C milling machine is one of two which Onsrud Machine Works, Inc., Chicago, has built for Boeing Aircraft Co. Boeing will use it for the B-52 program at their Wichita division.

The miller is reported to do the work of three machines—skin milling, spar milling and profile milling. It is able to perform accurate work with templates no thicker than ½", as the motor units are electronically tracer controlled. This makes for easier, faster and more accurate tooling. It also means that more templates can be stored in the same area.

The machine's primary function is to mill aluminum parts to any desired contour. It has three heads, which are capable of taking simultaneous contour, profile and angular cuts. Table and beds are stationary, with gantry type carriage supporting the cutter heads which pass over the work. Additional bed lengths may be added to the machine whenever required without any redesign. A three hp G.E. Thy-Mo-Trol drive powers the carriage longitudinally along the bed ways at variably controlled speeds up to nine fpm and eighteen fpm rapid traverse.



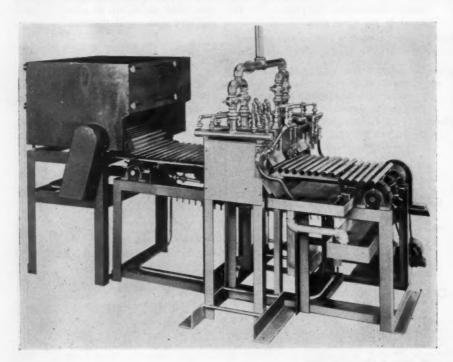
Automatic Heating Unit Speeds Up Tube End Annealing

Automatic in operation, this new gasfired high speed heating unit is reported to have increased end-annealing production of brass tubes for the manufacture of sink traps. Tubes are fed by an automatic hopper to an endless conveyor, which carries them through a heat zone, heating both ends of the tubes simultaneously to a specified length, prior to bending or flaring.

The heat zone consists of two high speed end heating furnaces, mounted on wheels, to permit adjustment for various tube lengths and to control the length of the tube section to be heated. Rapid heating in the reducing furnace atmos-

phere, followed by a water spray quench, prevents oxidation, and produces a sharp line of demarcation between annealed and unannealed portions of the tube. Tubes discharged from the end of the conveyor are ready for the forming operation.

The unit is adjustable to heat from ½" to 7" of each end of the tubes, and will handle 1" to 2" diameters, with over-all lengths ranging from 12" to 36". Production of the unit illustrated is 750 pcs/hr. of the 1½" size. Gas Appliance Service, Inc., 1211 Webster Ave., Chicago 14, Ill.



Norgren

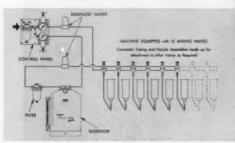
pray-Lube

as applied by System Square D Co.

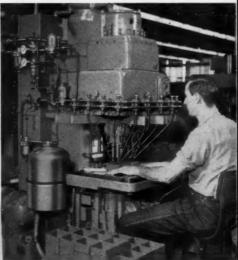
to multiple tapping operation, speeds production 30%

and in addition:

- eliminates time and labor formerly required for draining and wiping tapped parts
- relieves one man for more productive work
- · elimination of flood system greatly improves working conditions
- · substantial saving in lubricant.



This tapping machine in the Square D Company production line handles a wide variety of tapping operations requiring as many as 12 taps in simultaneous operation. On job shown, tapping 3 holes in each of 2 switchbox covers, Norgren Spray-Lube System increased production 30% ...



eliminated the cleaning process. Even greater increases were reported on other jobs.

The unpleasant and hazardous disadvantages of the previous flood system, splashing lubricant over the operator and the surrounding floor, has been eliminated by Spray-Lube. Lubricant saving (Stanicut No. 107) has been substantial. Solenoid valves permit the Spray-Lube System to be actuated only when taps are approaching and contacting the work.

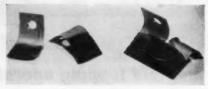


For complete data on this Norgren Spray-Lube application write for Blueprint SL 5 or phone the Norgren representative listed in your telephone directory classified section under Norgren Pneumatic Products.

Tear Test for Titanium Sheet

Douglas Aircraft Company, Santa Monica, Calif., has devised a tear test for titanium sheet which utilizes a Baldwin-Lima-Hamilton 5,000 lb. capacity universal testing machine. It separates usable quality sheet from rejects by measuring not just the tearing quality of the material, but a quality represented by several factors, including brittleness, formability and strength.

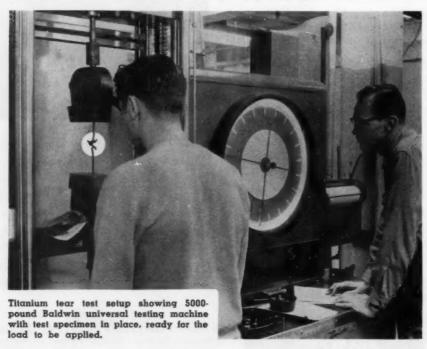
The test is performed by applying increasing load in a normal setting of tension testing of metals. The load is autographically recorded along with the strain during the test. The load increases until a maximum value is reached which is equivalent to the force required to start the tear from a preset notch. Then the load drops off



Titanium tear test specimens before and after the test. Whole specimen is on the right.

rapidly or slowly in relation to the ductility or brittleness of the material.

A brittle material drops its load suddenly and at the same time the crack progresses rapidly in a snapping action. A good or ductile material will drop its load much more slowly and tear with a slow progressive action.



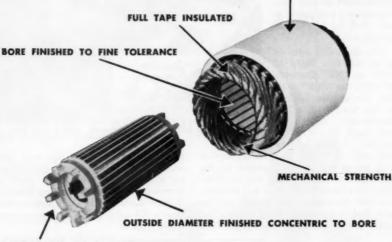
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The application of direct motor drive with WOODS' Shaftless Motors to high-speed spindles brings the peak of motive efficiency at relatively small cost. Conserves space—eliminates belts and gears—fewer wearing parts. The extensive and varied lines of WOODS' Shaftless Motors are available for nearly every class of direct application.

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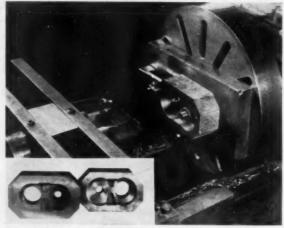
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Cast Iron Boring Operation Simplified

A special boring bar, utilizing a wedged-in tungsten carbide milling blade, is currently being used by the Energy Farm Equipment Co. of Monticello, Iowa, for boring and facing counterbore of cast iron hydraulic pump parts in one pass as shown in photograph.

This operation consists of boring two holes of 2.503" to 2.506" diameter by 0.878" to 0.879" deep and facing the bottom of the bore with a %" (maximum) width of cut. Depth of cut is %" to 3/16" on both bottom

and side of bore. The workpiece—a back pump casting—is clamped to the face plate of 14" LeBlond engine lathe which is run at 0.010" feed per revolution, 140 revolutions per minute on the bore, and 57 revolutions per minute for facing the bottom of the bore. This



Inset in lower left shows workpieces, before and after machining.

tooling provides part size and finish well within requirements, together with an average of 1400 pieces machined between blade resharpenings. Total life of their Kennametal (tungsten carbide) Grade K6 solid blade is approximately 15.000 pieces.

Steel cutting carbide jumps tool life

By switching to Wessonmetal 26 steel cutting carbide, the Clinton Machine Co., Maquoketa, Iowa, jumped tool life in the machining of single throw Arma steel crankshafts from 85 pieces to an average of 200 pieces per cutting edge.

Clamp-type holders have been replaced with special band-type Multicuts which provide four cutting edges per grind. Production is 1000 crankshafts per grind for a total of 200 pieces per index.

The operation consists of rough and finish turning the fly wheel and pulley ends of the 220 Brinell steel crankshafts, and is being done in one cut on a 20 hp New Britain GF tracer



lathe at 1210 rpm and .014" feed. Average depth of cut is from ¼" to ¾". The operation is being run dry.

SANFORD BENCH SURFACE GRINDER MODEL SG

for Wet*or Dry Grinding!

PRECISION . SPEED . SENSITIVITY

A low cost, precision machine for surface grinding dies, Instrument parts, gauges and other small parts which would fit in the palm of the hand.

By using Sanford Bench Grinders many manufacturers of precision machinery have drastically cut over-all costs for finishing small intricate parts. This releases large, more expensive machines for heavier duty work.

The Sanford SG is the only low cost Bench Surface Grinder that

- Grinds to less than .0001"
- Operates without vibration
- Assures long life because Meehanite castings are used in its construction

SPECIFICATIONS _4" traverse

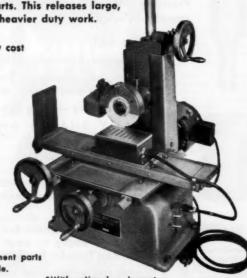
-8" longitudinal-6" vertical under 4" wheel, Approximate weight 160 lbs.

Complete details are included in illustrated bulletin.

Send for your copy today.

Reconditioning facilities, replacement parts and special attachments are available.

Send for price list.



*With optional equipment

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MANUFACTURING CORP.

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to economize STANDARDIZE





Ring Standardized Punches and Dies offer cost saving dependable performance for all of your perforating problems. Precision volume production to rigid specifications offers

- * Low cost
- * Complete interchangeability
- * Immediate shipments from stock on Standards plus prompt delivery on Specials
- * High quality long life

MANY SHAPES AND TYPES













Blanks — Pilots — Headless — Shoulder and Bevel Head Quills - Slug Ejector Punches -**Transfer Punches**

NEW!

Tough — Accurate Retainers for Ring Punches and Dies mount easily to your die set. Available in Key Type for irregular shapes.

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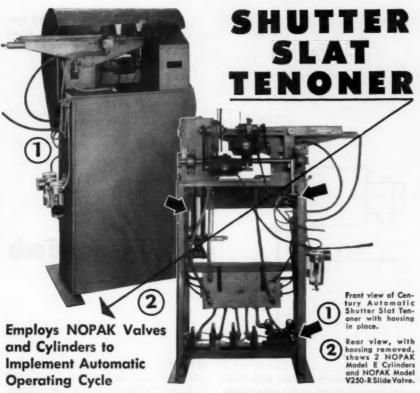
PUNCH & DIE COMP

Fenton Place

Jamestown, N.Y.

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MACHINE and TOOL BLUE BOOK



This completely automatic machine, built by Century Tool and Engineering Co., Culver City, Cal., turns out 1200 tenoned wood shutter slats per hour, automatically. It cuts dowellike projections on both ends of each slat and cuts the individual pieces to length; re-cycles automatically until the complete length of stock is cut into slats.

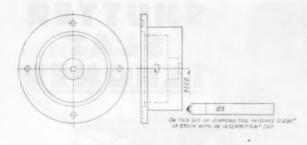
Cutter head is moved into position by a 2"x2" Model E NOPAK Cylinder. Stock is rotated 360°, during the cutting operation, by a NOPAK 2½" x 6" cylinder, controlled by a

NOPAK Model V250-R Slide Valve.

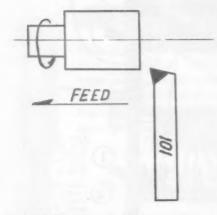
This is one example of how NOPAK Valves and Cylinders are used in automated operating cycles. For others, ask your NOPAK Representative to show you the NOPAK Application Manual.

GALLAND-HENNING NOPAK DIVISION 2754 S. 31st St. Milwaukee 46, Wis.



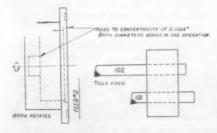


Facing a flanged part
of aluminum alloy 43 on
a Warner-Swasey turret
lathe



Diamond Tools

Turning a manganese bronze part: Three passes were necessary at the same setting for depth of cut, due to the spring of the work during turning



3. Boring two diameters in one operation on α Heald Borematic on aluminum alloy 43

SHAPED diamond tools for boring and turning operations are widely used and accepted by the ferrous, nonferrous and plastic industries for applications where a mirror finish is desired, where precision is demanded, or where abrasive materials are being machined.

The Industrial Diamond Engineering Co., Brooklyn, N.Y., has compiled data on various diamond tool applications. These tools were designed for a leading instrument company. Within a few days' operation the tools paid for themselves. The estimated life of diamond tools is up to two hundred hours or two thousand miles of cut. Naturally tool life is dependent upon depth of cut and material being machined.

For boring operations, it is usually best to set the cutting edge on the work Shaped diamond tools

Average 200 hours or 2000 miles of cuts

Cut Machining Costs

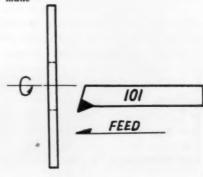
center and adjust speed, feed, and depth of cut according to the material being machined. Generally speeds are as high as possible without vibration (350 to 10,000 fpm); feeds are from .00075" to 0.005" rev. and depth of cut from 0.005" to 0.030". It should be pointed out that an intermittent cut has no adverse effect on a properly designed tool. This is indicated in the data and figures 1 and 6.

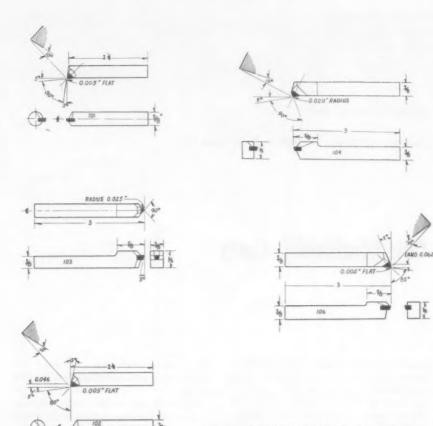
Figure 2 shows a manganese bronze part being turned to a concentricity of .0002". In this instance only 40 parts were turned out with carbide tools as compared to 3000 parts that the diamond tool produced. Even after producing almost 80 times as many pieces, the diamond tool was still in excellent condition for future use. For this setup

three passes were required since the work being machined had considerable spring.

Figure 3 shows the setup for machining an aluminum alloy with a high

4. Boring carbon steel 1035 on Heald Borematic



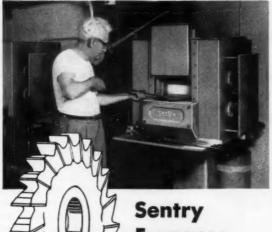


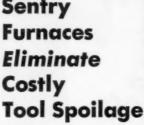
5. Diamond tools for boring, turning and facing

silicon content. This material is very abrasive to most tools. Before the introduction of diamond boring tools only six workpieces were produced by a carbide tool before resharpening was necessary. With diamond tools, as many as 30,000 pieces were produced without once removing the tool for resharpening. High quality work was obtained with fewer rejects of parts because of

greater uniformity, negligible tool wear and no build-up of material on the tool's cutting edge. These two holes were bored to a concentricity of 0.0002" on a 4" od and \%" id part. In order to accomplish this operation and still maintain a uniform bore from start to finish, two diamond tools were set to bore the holes simultaneously.

As an example of the ability of











Complete protection from scale and decarburization during the heat treating cycle is essential on tools similar to the milling cutter shown above.

Heat treating of expensive tools of high speed and air hardening steels calls for utmost reliability in heat treating equipment. Sentry Furnaces, with the Diamond Block Method of atmosphere control, have given hundreds of manufacturers this reliability, at the same time saving them money by eliminating costly tool spoilage.

Whatever tools your Heat Treating Department is concerned with — files, reamers,

taps, dies, form tools — only Sentry will heat treat them with the reliability and efficiency so essential to expensive items.

Make sure the right furnace — Sentry — is in your tool hardening or heat treating picture.



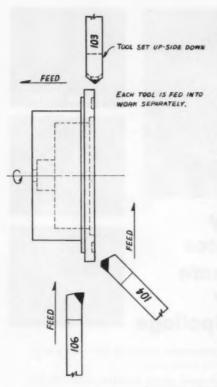
Request Catalog E-26
Tells the full story of
Sentry Furnaces and The
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Method.

Sentry ELECTRIC FURNACES

THE SENTRY CO. FOXBORO MASS.

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October, 1955



 Using three tools alternately on a flanged workpiece of aluminum alloy 43. Each tool is fed into the work separately.

diamond tools to take a light cut without glazing, refer to figure 4. Here a hardened gear ring of plain carbon steel had to be bored 0.006" on the inner diameter. The ring, 2" od x ¾" id x ½" thick, was hardened around the periphery on which the teeth were cut. However, during this process the inner hole was also hardened. Here a diamond tool produced 300 pieces on a light cut, yet a uniform bore concentric to 0.0002" was held. A carbide tool turned out only one piece per sharpening and this piece was rejected.

It must be understood that these diamond tools are not necessarily for specific jobs, since with the proper setup the same No. 101 tool was used in figures 2, 3, and 4 while tool No. 103 was used in figures No. 1 and 6. This is not necessarily true for other tools which are used as form tools for thread grinding.

The End

Hoover to Retire from Government Work

At the close of the filing of the Hoover Report, the former President gave notice that at 81 he was through and that he wouldn't undertake any more Government tasks. In a chat with newspaper men he brought out that as things stand now the Hoover Commission has found the nation actually has commitments and other obligations totaling an excess of \$240 billion above and beyond the \$277 billion technically included in the Federal Budget debt. The Hoover Commission turned out a

total of thirty reports during the eight years it has been on the job.

Labor Unions Disapprove of Trade Bill

The Labor Unions consider the bill as creating more jobs in Europe and less employment in the United States. Incidentally, the Labor lobby is driving hard to secure adoption of the Federal Minimum Wage of \$1.25 an hour. It is expected a compromise will be necessary on the basis of \$1 an hour minimum. Labor also will put up a hot fight against HR 5297, the Universal Military Training bill.

PRESENTING_

the NEW Bridgebort

Ram and Turret



WORM GEAR ADJUSTMENTS for setting head at angles in two planes or combination of same.

STANDARD SWIVEL ADAPTER makes it possible to set Shaping or Cherrying Attachments at angles.

RACK AND PINION CONTROL for in or out movement of Ram.



<u>NEW</u> (pat. pending) EXPANDING DOVETAIL LOCK binds all four surfaces together giving vibrationless performance.

The New BRIDGEPORT Ram and Turret has been designed and tested for full utilization of the 1 HP backgeared BRIDGEPORT Milling Head.

This Ram permits full universal setting of the Milling Head, Shaping and Cherrying Attachments.

Our toolmakers prefer it after a six-month test.

We are sure you will like it.

Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines

Encircle No. 339 on Card, Opposite Page 65

HOW TO BUY PORTABLE WHEELS

FOR MORE OUTPUT PER MAN-HOUR

"More Use per Dollar"

Look for a company that will engineer wheels specially to meet *your* specific requirements . . . to remove *more* metal, *faster*—at lower cost. Be sure that each type—flared cup, cone or plug and mounted points, as well as straight wheel—is bonded for its particular application and speed.

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196

MACHINE and TOOL BLUE BOOK

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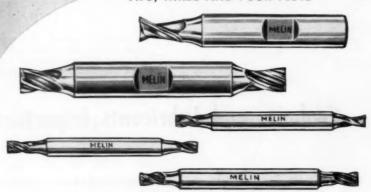
Benchmaster Manufacturing Co., 1835 W. Rosecrans Ave., Gardena, California Encircle No. 342 on Card, Opposite Page 65 MELIN

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Figure 1. Chip Distortion because of bending stress generates work heat.

Coolants and Lubricants Important For

Figure 2. Frictional heat results as the chip passes over the face of the tool.



THE importance of coolants and lubricants in automatic screw machine operation cannot be overemphasized. Much of the success in producing parts quickly and economically can be directly traced to these two important products used in machining. In order to present practical information on this important subject, it is first necessary to define each. Briefly, a coolant is a liquid used to dissipate heat generated in cutting and working aluminum alloys in machining operations. Its primary purpose is to reduce work and tool temperature for improved part output from the standpoint of finish and tolerance. Secondarily, a coolant affords a certain amount of lubricity.

The primary function of a lubricant is to provide an oil film at the fric-

Figure 3, Lubricant must reach all surfaces to be effective. Arrows shown path of fluid.



Figure 4. Ample quantities of cutting fluid will absorb work and frictional heat. Arrows indicate heat dissipation into fluid.

Screw Machines

tional points in machining. A lubricant will also cool the work and tool, but to a lesser degree than a coolant. The residual heat in oil in its cycle cannot be dissipated as rapidly as a coolant. Because of this, it is necessary to use care when considering a lubricant.

Regardless of the type of fluid used either for a coolant or a lubricant, thought not only must be given to its application but also to its removal. The correct choice is determined largely by experience. This infers a certain amount of trying. One shop may use a particular light oil, soluble oil, or liquid wax emulsion while another will use special shop compounds and mixtures. Whatever is used may be a determinant in successful machining. It is always good practice to carefully consider the cutting fluid used as a prime



Figure 5. Particles of metal will weld to the cutting edge causing build-up if cutting fluid cannot reach critical contact surfaces.



This is the final installment of a three-part series on "Machining Kaiser Aluminum with Automatic Screw Machines." The material contained in this series will soon appear in a technical book entitled "Machining Kaiser Aluminum" which has been prepared by Kaiser Aluminum & Chemical Sales, Inc., Technical Publications Dept., 919 Michigan Ave., Chicago, Ill.

essential along with tool design and

operating technique.

Cooling is necessary to prevent tool damage because of work heat created by chip distortion as metal is moved from the workpiece. As the cut is made, a bending action takes place in the metal chip as shown in figure 1. This results in compression on the inside of the bend and stretching on the outer side as the chip is removed. Bending action generates work heat which is the result of the actual work done times the rate at which it is done. Insofar as work heat or heat from distortion is primarily internal, cutting fluids in the main, do not affect the generation of such heat. They do, however, control the work heat on the cutting tool to that extent at which the fluid can dissipate such heat.

Frictional heat is created partly by the contact of the workpiece and cutting tool, but to a greater extent by the metal chip passing over the face of the cutter as it is parted from the parent metal. It can be reduced and controlled substantially by applying lubrication between the chip and the tool. When this is done, the actual tool temperature will depend largely on the quality and efficiency of the lubricant applied.* A simple method of illustrating frictional heat is indicated in figure 2. Thus, the pressure of the chip moving over the cutting tool generates frictional heat. It is on this bearing surface that ample lubrication must be applied to prevent cutter damage. With this basic approach, the reader can readily visualize the im-Based upon data from "Johnson's Wax Lubri-cants Handbook." portance of applying either a coolant or a lubricant at the critical heat source.

The method of application should be given considerable attention. Merely directing a stream of coolant or lubricant on the work may not be sufficient to reach the critical heated area. Oftentimes flooding the cutter and workpiece appears satisfactory, but in numerous instances, such has not been the case. Because of this, directing the fluid stream becomes quite important. This is especially true when making internal grooving or recessing cuts. It is often necessary to apply the coolant or lubricant under pressure to insure reaching the point of tool contact. Then, too, drilling operations become critical as depth of hole increases.

To improve cutting efficiency, a cutting fluid must perform three sepa-

rate but related functions.

1. Lubricating Function. The first and most obvious duty of the cutting fluid is to lubricate the tool, workpiece, and chip, see figure 3. It is believed that as the chip separates from the workpiece, a partial vacuum is created in the "pocket" formed where the tool, workpiece, and chip meet. This, combined with capillary action, tends to draw the cutting fluid to the point where the cutting takes place, thus keeping a fluid film between the tool and the workpiece and the tool and the chip. Metal-to-metal contact, and consequently friction, is greatly reduced. Less power is required to turn the workpiece, less heat

This high-speed flat belt lasts up to 5 times longer

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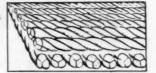


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This drawing represents the tightly interlaced cords of woven and braided belts. Flexing of the belt at high speeds sets up internal friction which causes braided or woven belts to saw themselves to pieces.

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TPA 58

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Speed-Flex Belts
for high-speed equipment requiring flat belts

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October, 1955

203

is generated, and tool wear is reduced.

- 2. Cooling Function. Because heat always flows from a hotter substance to a cooler one, the heat generated by friction in the workpiece, tool, and chip tends to be absorbed and carried away by the the cooler cutting fluid. The fluid itself is thus heated and would lose its cooling ability were it not constantly being displaced by cool fluid. It is for this reason that cuting fluids should always flow steadily, in copious quantities, over the tool and workpiece. If sufficient fluid, flowing with sufficient velocity, is applied, figure 4, heat can be removed almost as fast as it is generated and the temperatures of the tool, workpiece, and chip can be controlled at safe working levels.
- 3. Anti-Welding Function. In spite of the lubricating and cooling action of the cutting fluid, some metal-to-metal contact always exists in limited areas on the workpiece, tool, and chip, and temperatures high enough to weld specks of metal to the workpiece and tool are generated in limited areas. To prevent this, wax compounds or emulsifiable oils are added to cutting fluids. These coat the contact areas with a light film to which particles of metal will not weld readily, figure 5. The film also tends to keep temperatures from rising above the welding point.*

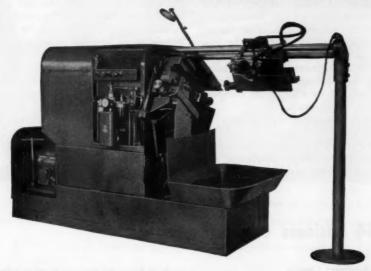
Both coolant and lubricant are important in flushing chips away from the tool and work. Fluid streams should be directed so that chips do not become massed on the cutters or the part. The type chip produced, the method of chip breaking, and the openness of tooling setups will play a part in how effective chip flushing will be. In deep hole drilling, cutting fluid under pressure is depended upon to remove chips from the hole as the drill penetrates. The amount of pressure to use is determined by the needs of the job.

A blanket recommendation as to the type of coolant or lubricant to use on aluminum is impractical. Still, when job requirements are known in advance with the types of operations to be performed, it is possible to make a close selection for specific needs. Obviously, if most of the work centers in plain cutting where there is little friction because of speeds and feeds employed, a coolant with low lubricity can be used. Should cuts be heavy or if tapping and threading are done, a lubricant is needed. In some instances, coolant compounds and emulsions are satis-



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Cuts Off Tubing, Pipe and Shafting . . . FAST

Cuts off longer pieces than a regular automatic machine. In fact, cuts off any length you want-and cuts it faster. If your production requires quantity cuttingoff of tubing, pipe or shafting, check the figures below against your present time.

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11/4" Cold Rolled

1" Tubing

This machine cuts off and This machine cuts off and This machine cuts off and

chamfers both outside edges of ½" .030 wall tubing. 5" cold rolled, 20" long, at the rate of one every long at the rate of one every rate of one every 20 seconds. one every 3 seconds.

These popular, time saving machines are now available in four sizes, handling work up to 63/4" O.D. Their many cost cutting features are described and illustrated in our latest catalog that will be mailed promptly on request.

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MODERN MACHINE TOOL COMPANY Jackson, Michigan

factory provided such fluids have a lubricating as well as a cooling quality. Such lubricity is obtained by the ratio of mix. If this is done, the compounds should be carefully measured before mixing. Guessing at consistencies merely complicates and often defeats the purpose and qualities of the base material.

When a satisfactory coolant or lubricant is used on a specific job, a detailed record should be kept of its composi-

tion and consistency.

Cutting fluids should always be maintained in a clean, fresh condition. This factor is not peculiar to aluminum alone, but is important because of this metal's finished appearance. There should be no oil leaks from machine components into the coolants for this condition can cause staining of work and can influence the effectiveness of the cutting fluid used. Machine packings, wipers, oiling circuits, and connections should be checked for leaks. Should there be drips or seepage, such should be taken care of immediately.

Where copious quantities of cutting fluid are used for drenching the cutters and work, ample splash guards and sump pumps are anticipated. If high pressure lubrication is used on the cutting tool measures should be taken to control excessive mists created by this method.

The End.

1954 Business Census Launched

1954 Business Census

Bureau of the Census is now launched actively in making a survey of the 1954 Census of business. It is interesting to know the queries are in regard to location and kinds of business; annual sales and/or receipts; payrolls and employment; number of properties and unpaid family workers of unincorporated businesses.

The enquiry is to elicit information about the form of organization (corporation, partnerships, etc.); inventories; credit sales and accounts receivable; bad debt losses for the wholesale trade only.

Further enquiries cover operating expenses for the wholesale trade; wholesale storage capacity; wholesale sales by commodity lines. In addition there are a variety of specialized enquiries, such as hotel occupancy, theater admissions, number of machines operated by vending machine operators, lumber inventories and purchases, products baked and ingredients used by retail bakers, etc.

An effort will be made to secure information about man-hours of production; cost of materials, fuels and electric energy, industrial water consumption, and horsepower rating of power equipment at the end of year. It will be remembered the Census also covers agriculture and mineral industries.

The Spanish Government has been given \$1.417 million by the Foreign Operations Administration to purchase machine tools which it is said are required for the modernization and expansion of the Spanish munitions industry.



These new Luers blades are held to precision tolerances on centrality and parallelism. Close tolerance grinding of all blade surfaces assures:

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EMPIRE TOOL COMPANY

DETROIT 13, MICHIGAN

Encircle No. 346 on Card, Opposite Page 65

by C. T. Bower

Consultant Tool Engineer

Drill Press Automated to

WHEN the production of drilled holes reaches the number of about 30 per hour, for several hours, it is time to think about mechanizing the drill press so that manual lever-pulling is avoided.

Once the down-feeding of the drill into the work and the automatic retraction of the spindle has been accomplished, thought can be given to the fitting of automatic feeding devices which will load, clamp and unload pieces of work. In this way it is possible for one operator to feed one or two drill presses with minimum fatigue.

Air-actuated attachments exist for the mechanization of drill presses, but require the installation of an air compressor. The device described in this article is a purely mechanical attachment for fitting to a standard 15 in. sensitive drill press and was designed for use by a small shop which had no compressed air supply and did not con-

sider its installation to be an economic proposition. The general dimensions of the device will vary with the make of drill press, but sufficient information is given in the accompanying drawings to enable any standard type of machine to be automated.

In designing the automatic cycling gear, one over-riding requirement was low first cost, therefore, the attachment has been arranged to utilize standard V-pulleys and spur gears, together with welded steel plate.

The basic specification of an automatic drill press feeding device calls for automatic down feed of the drill to a controllable depth and automatic return upward at the conclusion of the actual cutting period, also to a predetermined position. Another requirement is that the drill should penetrate the work for a controlled distance per revolution; this is the feed rate, and

- · mechanical attachment eliminates compressed air need
- · automatic feeding device loads and unloads
- any standard machine can be automated
- · operator can feed two machines at same time.

by C. T. Bower



it should be variable according to the drill diameter and the work material. All the above requirements are met by the device described. It would have been advantageous to have a rapid approach of the drill to the work before drilling commenced, but this proved impossible without increasing the complication and cost of the device.

One of the major difficulties in designing an automatic feeding attachment into an existing drill press is to devise some method of linking mechanically the drill spindle to the feed mechanism. From the side elevation, it can be seen that the small step A of the spindle cone pulley has been utilized for driving the feed gear. On a four-speed drill press, this reduces the available spindle speeds to three. This is unfortunate, but on the range of work intended on the particular machine described, the top speed could be sacrificed since it was too fast for the drilling operations contemplated.

Another design difficulty is in obtaining adequate speed reduction for the feeding mechanism. The top step of the spindle cone pulley has an outside diameter of 2" on the machine and this was connected by V-belt to a stock pulley B of 10" diameter. This is bulky and it sticks out at the side of the machine toward the rear, but in the circumstances it was felt that this could be tolerated. The large pulley runs on a vertical spindle to which is attached a small 20-tooth pinion C driving a 40 tooth gear D. The combination of pulleys and gears gave a ratio of 1 to 10 between the spindle and the axis of the 40 tooth gear.

The actual vertical feeding movement is derived from a long feed screw E to the top end of which is attached the gear wheel, D. It runs at 1/10 drilling spindle speed and has a pitch of 16 threads per inch; crest to crest distance on the screw thread is 0.0625 in. so that 1/10 of a revolution is 0.00625 in. With this arrangement, the nut on the vertical feed screw will travel 6¼ thousandths of an inch per drill revolution. This is a satisfactory feed rate for a drill of ½" diameter with various work materials.

Investigation of recommended feed rates for drills of various diameters show that 2 thousandths feed per revolution is suitable for drills below ½" diameter; 4 thousandths for drills about ½" diameter and from 4 to 7 thousandths for drills between ½" and ½" diameter. From this, three different feed rates would cover the drill diameter range usable on the drill press which has a maximum capacity of ½".



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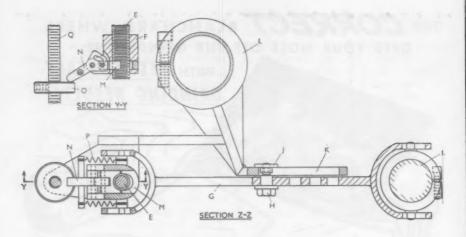
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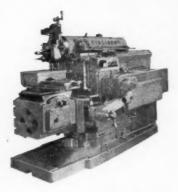


It can be seen from the side elevation of the assembled automatic feed gear that a nut F on the traversing screw is connected to the drill spindle quill by a simple lever G pivoted at its center. When the nut travels up the screw, the spindle will be fed downward through the same amount. With the lever fulcrum disposed centrally on the lever (as drawn) the feed rate of the spindle will be 6½ thousandths per drill revolution.

To obtain the other required rates of feed, the fulcrum H of the lever can be placed in three other different positions closer to the drilling machine spindle and this has the effect of reducing the feed rate. For example, the lever used on the drilling machine shown is approximately 12" long. By moving the fulcrum so that it is 3" from the spindle and 9" from the feed screw, the nut travel will be divided by 3 so that the actual down feed of the spindle will be about 2 thousandths per drill revolution.

As shown on the lever in the assembly drawing, there are four fulcrum holes with the approximate feed rate in thousandths per revolution stamped adjacent to them. The fulcrum pin H is in the hole giving the maximum feed rate of 61/4 thousandths. The other three holes give a feed rate choice of 4, 3 or 2 thousandths per drill revolution.

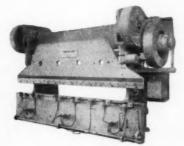
A sectional plan view (Section Z-Z) of the feed lever is given. It is connected to the machine spindle I by an annular ring clamped to the bottom end of the spindle quill. Two pins project diametrally from the ring and engage with elongated holes in the forked end of the lever. The four different holes for accommodating the fulcrum pin are drilled through the lever and it can be seen that the pin is threaded at one end for engagement with a nut J. This nut is flatted on its diameter and can be slid along the elongated slot K in the support bar to line up with the different holes in the feed lever.



Important Announcement

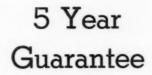
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Metal Working Industry



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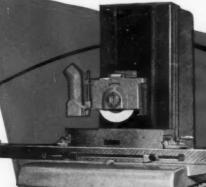
CROSS FEED: instantaneous at either or both ends of table travel, infinitely variable from 0 to 7/32" by dial adjustment

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Hook-Tooth Blade with a positive rake. Teeth hook themselves into the work. They saw instead of scraping and they cut full helical chips.

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Anyway you look at it—in terms of greater production, lower blade costs, less man-hours, fewer machines—it all adds up to real savings with LENOX Hook-Tooth Band Saw Blades.

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Right

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Remember the true cost of a machine is entirely dependent upon its output. If you don't have the RIGHT machine on your job, it may pay you to see that your competition doesn't get one before you do.

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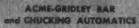
Today they enjoy all the production benefits on large parts that six-spindle tooling is giving them on smaller ones.

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The support bar is part of a welded assembly built up from pieces of flat steel and carries the supports for the feed screw and its gearing at one end. The supports and the bar are welded to an arm which is secured to the drill press pillar by a ring L which is split for a clamp screw.

When the feed nut has reached the end of its desired stroke on the feed screw, arrangements are made for it to dis-engage itself from the screw thread. The disengagement must be accomplished rapidly by means of a load-and-fire mechanism (also known as a toggle). The nut release mechanism is shown in the enlarged sectional plan view of the lever and in Section Y-Y.

The actual nut comprises a housing F which is bored with a plain hole to slide on the feed screw E exterior giving sideways support. The nut comprises a flat bronze plate M with an elongated hole bored through it. Half of the hole is threaded for engagement with the feed screw, so that horizontal sliding will push the thread of the half nut into engagement with the feed screw, or will disengage it therefrom. The effect is that of one-sided split nut, as would be used on a screw-cutting lathe.

To slide the nut plate horizontally, a pivoted member N is provided with a projecting arm at one end and an approximately accurate slot at the other. Through the slot passes a pin which is attached to the half-nut. The slot is shaped so that it holds the half-nut positively in or out of engagement with the feed screw thus preventing the screw threads from forcing themselves apart.

It might be mentioned here that the feed screw thread is of buttress form with the flat face uppermost—the position for positive feeding of the drill against maximum load.

As drawn, the projecting lever for the half-nut is pointing downward and the nut thread is disengaged from the feed screw thread. The drill spindle quill is travelling upward under the action of its built-in return spring and the nut is moving downward and sliding over the screw. When the toggle lever comes into contact with the stop plate O it will be pivoted on its axis until it is just past the horizontal position. At this point, the tension springs P will snap the lever over into the opposite position so that it is pointing upward and the half nut will be pushed horizontally into engagement with the feed screw. The slot in the toggle lever is designed to hold the half nut in engagement until the toggle lever has moved to mid-position; the engage-



ment or disengagement of the half nut is not gradual; if it was, the threads would be rubbed away rapidly by the steel feed screw.

Stop plates O to control the reversal of feed comprise a pair of discs with internally threaded holes so that they can be adjusted up and down the vertical stop pillar Q. The pillar is a length of standard screwed studding and the plates may be locked in their set positions by a headless brass set screw passing radially through the wall of each one and bearing on the stop screw thread.

As designed, the feed equipment utilizes the full 4½" travel of the spindle quill on the machine, therefore, the feed screw length must be three times this when using the finest

feed. The feed nut must travel 12¾" for 4¼" of spindle travel. Although quick approach is not provided for the drill, the return stroke takes place rapidly since the quill return spring is used for raising the spindle. This is not objectionably rapid as the load of the nut and lever mechanism prides a damping effect; there is no objectionable bump when the spindle rises rapidly under the action of the quill return spring.

Although this article has been confined to describing the feed mechanism only, it will be apparent that light indexing mechanisms can be actuated by suitable connection with the feed lever. Also, gates and traps can be actuated by the same means when operating hopper-feeding devices.

The End

Commissaries Threaten Retail Stores

Despite reports issued by the Defense Department, the Hoover Commission states last year this Department operated at home and abroad a total of 438 commissaries, with sales of \$206 million. The Commission states these operations have continually expanded and are still expanding and there appears to be no way of bringing them under control. In many localities the Hoover Commission reports the commissaries are driving retail stores entirely out of business. The latest Commission report on water resources insistently urges that TVA be sold to private operators. The report also vigorously criticized the Post Office Department for invading the field of private business, and for extravagance in operation.





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Builders of Precision Machinery since 1904

OPERATION FEATURE

Helical Gear Hobbing Machine has Oblique Feed, TriLineal Feeding Cycle

"HOBLIQUE," a helical gear hobbing machine developed by Gould & Eberhardt, Inc., Irvington 11, N.J., features a combination of feeding the hob tangent to the helix of the gear being cut and automatic TriLineal feeding cycle which provides three feed rates in series, two successive fast enter feeds at different rates, followed by the normal hobbing feed rate.

Feed along the helix angle is hydraulically operated, eliminating lead screw error. No differential or lead cam is required, and change gear calculations are avoided entirely. Hob wear is distributed over the entire length of hob, consequently, no shifting of hob is needed, nor are long hobs or tapered hobs required. The oblique feed resulting in much shorter hob travel, together with the two successive fast enter feed rates plus high hob speeds, is claimed to result in optimum production.

A fully automatic cycle is actuated by a single pushbutton. Operation is simple, comprising the following sequence: 1. Operator loads work and presses start button.

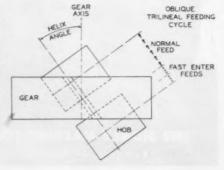
 A. Work support arm is lowered and locked, at the same time work is clamped.

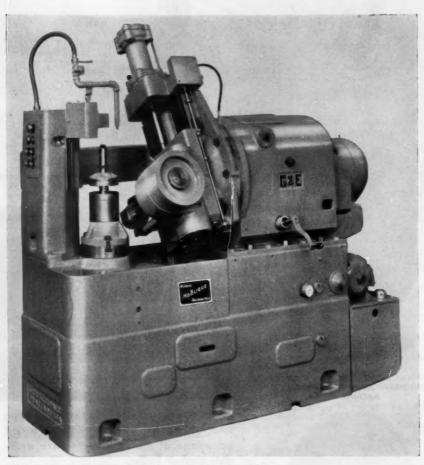
B. Hob rotates and climb feeds at two successive fast enter rates, followed by normal feed.

C. Hob stops and returns through cut.

D. Support arm elevates and work unclamps.

Diagram showing oblique TriLineal feeding cycle.





G & E 10 HQ HoBlique helical gear hobbing machine.

2. Operator unloads work.

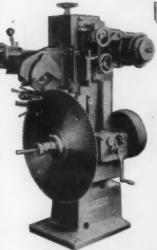
The machine is intended primarily for cutting helical gears preparatory to shaving; consequently, full advantage can be taken of multiple-thread hobs. For some applications accuracy obtained with single-thread hobs is suitable for finish-hobbing gears in one cut.

Gear hobber is adaptable for a wide

range of right- and left-hand helical gears up to 45° helix angle. High hob speeds up to 550 rpm are available and capacity is from 2¾" to 10" diameter, 8 to 14 ndp with 6" maximum face.

The HoBlique can be arranged for quadricycle with plunge feed when required and offers excellent possibilities for automatic loading.

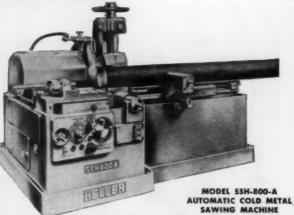




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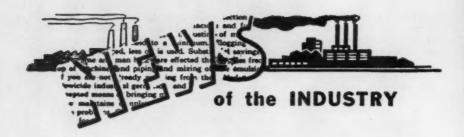
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Giddings & Lewis Buys Cincinnati Bickford, Kaukauna Machine

At a special meeting of the stock-holders of the Giddings & Lewis Machine Tool Co., held at Fond du Lac, Wis., Aug. 31, approval was granted for the purchase of all outstanding capital stock of the Cincinnati Bickford Tool Co., of Cincinnati, O., and for the acquisition of the Kaukauna Machine Corp., Kaukauna, Wis., on an exchange of common shares.

A total of 67,314 shares of Cincinnati Bickford was purchased at \$80 a share—\$5,385,120, whole purchase price. Kaukauna Machine was acquired through the exchange of 40,000 shares of Giddings & Lewis common for the 125,000 outstanding shares of Kaukauna Machine.

G & L shareholders also authorized the borrowing of \$4,000,000 on a 15 year mortgage note. Of this, \$706,000 will be used to retire G & L long term debt, \$510,000 to retire Cincinnati Bickford long term debt, and \$2,784,000 to apply on the Cincinnati Bickford purchase price. The balance of the purchase price will be paid from working capital and G & L shares.

Ralph J. Kraut, G & L president, said the acquisitions would both expand Giddings & Lewis operations and diversify its products. Cincinnati Bickford manufactures radial and upright drills, and Kaukauna Machine, portable universal drilling and tapping machines. The newly purchased companies will continue to operate at their present locations, Kraut said.

Cincinnati Bickford employs 400 people in a plant totaling 266,000 square feet of floor space. Kaukauna Machine employs 250 in its plant and foundry totaling 96,000 square feet of floor space.

Precision Barrel Finishing Contest

The 1955 Almco Supersheen Award Contest sponsored by Almco Supersheen Div., of Queen Stove Works, Inc., of Albert Lea, Minn., begins Sept. 11.

Three separate awards will be held in 1955 plus a grand prize award in each division for the best cost saving story for the year 1955. The first award will cover the period from Feb. 15 to May 20; the second from May 21 to Sept. 10; and the third from Sept. 11 to Dec. 31. Each award will consist of two separate divisions. Winning award will be \$100 and second place will be \$50 in both divisions.

Anyone or any company is eligible to compete for the Almco awards who is using Almco Supersheen finishing equipment.

All entries must consist of the part before finishing and the part after Supersheen finishing, accompanied by the official award entry form which can be obtained by writing to the company.

To enter, select any parts finishing problem that you have solved by the Almco Supersheen speed finishing process.

National Metal Show Oct. 17-21

THE AMERICAN SOCIETY for Metals will present the 37 annual National Metal Congress in Philadelphia from Oct. 17 to Oct 1st.

The exposition will be the most significant since metallurgical developments have advanced to a stage where complete and thorough exchanges of information are vital to the continued growth and prosperity of the U.S.

Over 450 firms engaged in either the production of metals, the treatment of metals, the fabrication of metals into component parts or products; or in rendering services to all of these, will exhibit.

More than 210,000 square feet of floor space, nearly five acres, will be utilized by the exhibitors for the display and demonstration of their equipment, products and services. In addition, thousands of square feet have been set aside for meetings, forums and lectures and other activities connected with the congress and exposition.

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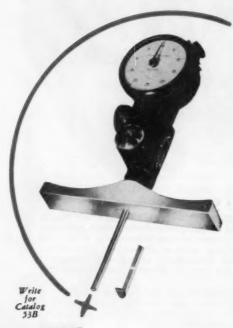
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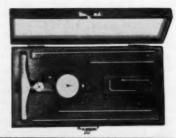
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But don't take our word for it. Try REX in your own shop. Compare its structure, finish, hardenability, carbide distribution and general uniformity. Measure the extra performance you get. You'll see for yourself why no other tool steel outperforms REX . . . why it's the standard for comparison wherever high speed steels are used.

Next time you buy tool steels, be sure of top performance - specify REX. Remember, it's made only by Crucible - and is available from local warehouse stocks, or by prompt mill delivery. Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

CRUCIBLE first name in special purpose steels

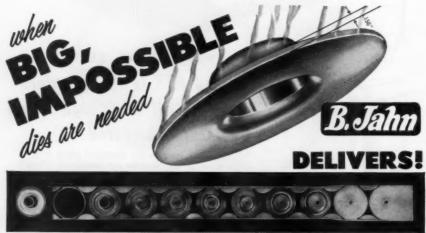
Crucible Steel Company of America

October, 1955

Encircle No. 362 on Card, Opposite Page 65

237

Magnaflux Corporation	446	Metals & Controls Corp.	1440
Magnethermic Corp.	1740	Metallurgical, Inc.	218
Magnetic Analysis Corp.	2024	Metalwash Machinery Corp.	1924
Malayan Tin Bureau	1772	Minnesota Mining & Mfg. Co.	1668
Manco Manufacturing Co.	1471	Mitchell Radiation Products Corp.	2016
Marsh Stencil Machine Co.	2147	Modernair Corp.	959
Mead Specialties Company	1872	Mullins Manufacturing Corp.	918
Merrill Brothers	1354	A. B. Murray	2111
Metal & Thermit Corp.	153	,	
Metal Improvement Co.	2239	N	
Metlab Company	1047	NARESCO Equipment Corporation	1577
Metallizing Company of America	2061	National Cored Forgings Co., Inc.	431



Here's a B. Jahn progressive die that performs 10 precise operations on .156" cold rolled steel with one blow. The stock was so heavy that a 600 ton press was needed. The components were red hot as they rolled from the press at the astonishing rate of 32 per minute. B. Jahn had to build the 10 station die to produce intricate hub bearing retainers so precise that they could be used as they came off the press — with no further machining. Sounds unbelievable, but it's typical of the impossible dies made routine at B. Jahn. Let B. Jahn tool your next "can't be done" job!



Send today for the B. Jahn brochure—it's packed with fascinating case histories. B. Jahn

THE B. JAHN MANUFACTURING COMPANY, NEW BRITAIN, CONNECTICUT

National Lead Company National Precision Casting Corp. The National Radiator Co, National Spectrographic Labs., Inc.	130 1768 1330 540	New York Air Brake Co. Nord International Corp. North American Philips Co., Inc. Nuclear Research Corp.	1171 1257 1154 1857
National Torch Tip Co. National Welding Supply Assoc. Nelco Tool Co., Inc.	2149 1961 1163	Oakite Products, Inc. Ohio Crankshaft Co.	1767 1509
New Hermes Engraving Mach. Corp.	1273	Olin Mathieson Chemical Corp.	524



POWER HACK SAW BLADES

For heavy feeds and fast speeds, for clean, straight cutting, long blade life, specify Capewell Technite all-hard molybdenum high speed steel blades, Capewell High Speed all-hard Tungsten type 18-4-1 high speed steel blades, or Capewell Safetech, the soft-back safety blade with the hard-ened high speed steel cutting edge. Ask, too, about Capewell Band Saw Blades, Hand Hack Saw Blades and Microloy Ground Flat Tool Steel. The Capewell Manufacturing Co., 82 Governor St., Hartford 2, Conn.

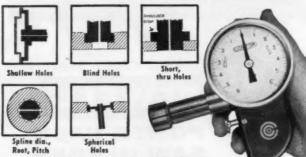
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CAPEWELL MAKES EVERY TOOTH COUNT

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Title Olive Testine Marking Co.	1428	Albert W. Pendergast Safety	
Tinius Olsen Testing Machine Co. Optical Film Engineering Co.	1067	Equipment Co.	2054
Osborn Manufacturing Co.	718	Peerless Electric Co.	1155
		Pennsylvania Salt Mig. Co.	1272
P		The Penton Publishing Co.	1228
Pangborn Corp.	1032	Philadelphia Electric Co.	1262
Pantex Mfg. Corp.	2015	Phillips Manufacturing Co.	512
Park Chemical Co.	330	Phoenix Products Co.	1672
Parker Rust Proof Co.	1549	Pittsburgh Crushed Steel Co.	1162
Pedrick Tool & Machine Co.	741	Pneuma-Serve, Inc.	640

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Unique Advantages

- Positive gaging accuracy to fraction of .0001" regardless of who operates it.
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Investigate the gage used by the thousands in jet engine, automotive transmission, household appliance, farm machinery, guided missile and other volume-precision plants. IT MAKES PRECISION GAGING EASY... at machine... at inspection bench... for selective assembly. No other like it—investigate and see why.

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Porter McLeod Machine Tool Co. Precision Metalsmiths, Inc. Precision Tube Co., Inc. Precision Welder & Flexopress Corp. Pressco Casting & Mfg, Corp. Production Machine Co. Pyrometer Instrument Co. Inc.	1367 1761 1167 1158 2028 1339 1439	N. Ransohoff, Inc. Reed-Prentice Corp. Reeves Pulley Co. Reid-Avery Co., Inc. Rockwell Manufacturing Co. Rollie Manufacturing Co., Inc. Joseph T. Ryerson & Son, Inc.	1608 602 445 1519 1530 1620 931
R		5	
Randall Mfg. Co. Ransburg Electro-Coating Corp.	550 1983	George Sall Metals Co., Inc. A. Schrader's Son	1062 1458





the POWER QUILL outperforms, outlasts the outmoded lathe grinder!

The Precise Power Quill is a small powerful high precision tool that outperforms and outlasts cumbersome lathe grinders costing one hundred times as much. It can be mounted on any standard machine tool to mill, grind, or finish to tolerances of .0001". Operates at speeds up to 45,000 RPM, develops up to 1/2 H.P. and works on any material with abrasive wheels or tungsten carbide tools.

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Power Quills, Portable Electric Grinder Millers, High RPM Milling Machines, Milling Machine Accessories, Speed Lathes, Commutator Slotters, Grinding Tools, Rotary Tools, Carbide Tools.







Sciaky Brothers, Inc.	946	Shenango-Penn Mold Co.	650
Scientific Electric	1279	Sieburg Industries	1876
Scott Paper Company	915	SKIL Corp.	1980
Seal Cast Company, Inc.	2153	A. O. Smith Corp.	1842
Selas Corporation of America	1601	Smith Welding Equipment Corp.	1714
The Sentry Company	635	Socony Mobil Oil Co., Inc.	1350
Service Diamond Tool Co.	2135	South Chester Corp.	1445
Service Machine Co.	1640	South Florida Test Service	2215
Service Machine Co.	1358	Special Libraries Assoc., Metals Div.	123
Sharon Steel Corp.	1719	Spee-Flo Co.	2012
Shell Oil Co.	1749	The Spencer Turbine Co.	1946



35 years of study, work, and experience has made the Schaublin the leader in its class.

SPECIFICATIONS

Height of center	23/4"
Bed length	235/8"
Bed height	43/4"

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30 PARK AVENUE.

MANHASSET. N.Y.

CHICAGO DETROIT

Sperry Products, Inc.	1320	Tech-Pacific	2167
Stanat Manufacturing Co.	1355	Tempil Corp.	1533
Standard Die Set Manufacturers, Inc.	1675	Texas Co.	743
Stanley Electric Tools	2123	Thomas Publishing Co.	973
The L. S. Starrett Co.	1720	Thomas Register of America Mfg.	973
Steel City Testing Machines, Inc.	324	Thomas Electric Welder Co.	971
Steel Shot Producers, Inc.	1162	Thor Power Tool Company	731
Edwin B. Stimpson Co., Inc.	411	Timesavers, Inc.	2250
Alvin M. Stock, Inc.	1757	Tinnerman Products, Inc.	1467
F. I. Stokes Machine Co.	1302	Tin Research Institute, Inc.	439
Stone Machinery Co. Inc.	551	Arthur Tickle Engrg. Works, Inc.	1808
Sun Oil Co.	922	Titanium Metals Corp. of America	624
Superior Tube Co.	1470	Titan Metal Manufacturing Co.	341
Surface Combustion Corp.	304	Torit Mfg. Co.	1454
Swan-Finch Oil Corp.	1662	Torsion Balance Co.	1055
Swift Industrial Chemical Co.	1975	Townsend Co.	1371
Symington-Gould Corp.	1054	Tranter Manufacturing, Inc.	1777
		Triplett & Barton, Inc.	254
-		Tubular Micrometer Co.	950
T T	1340	Turco Products, Inc.	1319
Tapmatic Corp.			
Taylor Dynamometer & Machine Co		U	
Taylor Instrument Co.	966		1975
Technical Operations, Inc.	2023	Union Carbide & Carbon Corp.	1375



United Scientific Co.	2040
United Shoe Machinery Corp.	735
U. S. Electrical Motors, Inc.	1816
U. S. Plywood Corp.	1871
United Welders, Inc.	521
Universal Cyclops Steel Corp.	1520
United Wire & Supply Corp.	2009
Universal Castings Corp.	1856
Upton Electric Furnace Co.	1867

Westinghouse Electric Corp. 1510 Weston Electrical Instrument Corp. 2224 Whitehead Metal Products Co., Inc. 1344 Wilson Mech. Inst. Co. 1044

The Yale & Towne Manufacturing Co. 1557

Vacu-Blast Company, Inc.

104
816
1771
1829

Affiliate company formed to serve Syracuse area

The J. L. Osgood Machinery & Tool Co., Buffalo, recently formed an affiliate, Osgood Machinery, Inc., to distribute machine tools, presses, and production equipment in the Syracuse area. Officers are: A. L. Mikulec, president; C. E. Linden, Jr., vice-president; H. K. Rose, treasurer; S. Mikulec, secretary; and George R. Kinney, asst. secretary.

Carl E. Linden, Jr. is general manager of the Syracuse office, which is located at 218 Harrison St.

Waldes Kohinoor, Inc.	1466
Wales-Strippit Corp.	1210
Waukee Engineering Co., Inc.	1239
Weatherhead Co.	717
Wells Manufacturing Corp.	730
Weltronic Company	1955
Westfield Sheet Metal Wks., Inc.	760



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of the fundamentals of setting up a job and requires a specialist's experience. Characteristic of the design of all STURDIMATIC LIVE CENTERS is a low overhang and a slight custioning action that compensates for expansion due to heat shock and excessive thrust loads—reducing wear to a minimum. Send us your blueprints and specifications—we will see that your job is set up with the right Live Center. Standard shanks with Morse taper carried in stock.



Literature

CATALOGS AND BULLETINS AVAILABLE FROM MANUFACTURERS

For copies of the literature in which you have an interest use the postage-paid postcard between pages 234-235. Merely circle the identifying number and mail the postcard.

- 1. Magnetic Chucks. A new general catalog which contains information on rectangular, swivelling, rotary and magnetic chucks, vacuum chucks, special types, demagnetizers, planer parallels and a new line of lifting magnets has been released by O. S. Walker Co., Inc., Dept. BB, Worcester, Mass.
- 2. Control Valves. Problems of controlling air, oil, or water may be easily solved by examining the 40,000 hydraulic and pneumatic control valves described in Folder No. 14 issued by Versa Products Co., Inc., Box 31, 253 Scholes St., Brooklyn, N.Y. The six sizes of Versa valves are illustrated with the more frequently needed Versa actuating devices. Included also are descriptions of various valve types, solenoid actuated valves and manifold mount valves.
- 3. Air-Line Lubricators. Users of airoperated tools—from the smallest handheld air tools to the largest quarrytype drills—will be interested in a bulletin (Form 4169) on air-line lubricators published by Ingersoll-Rand,

- Dept. BB, 11 Broadway, New York City 4. Aimed to show damage of tools due to lack of lubrication and to show the protection to air tool parts by using I-R Air-Line Lubricators the bulletin carries a colored cross section of a lubricator and a concise explanation of how it works. A table on the back cover will aid in the selection of the proper size lubricator for the machine or units to be fitted.
- 4. Air Clutch Parts. Forty-one component parts for the Ferracute air clutch are pictured in Catalog CL-2 issued by Ferracute Machine Co., Dept. BM, Bridgeton, N.J. Legended diagram of air clutch identifies parts of machine and facilitates ordering.
- 5. Gears of Integrity deserves a place in all shop libraries as an authentic reference. Published to commemorate the 50th Anniversary of Sier-Bath Gear & Pump Co., Inc., Dept. BM, 9252 Hudson Blvd., North Bergen, N.J., this 44-page lithographed brochure is beautifully illustrated with multi-color photographs. Subjects covered in the bro-

chure include cause of early tooth failure, simple physics of gear movement, shock loads, remedy for gear errors, magnetic detection of gear defects, etc. Of special interest to design engineers are the reference tables including a condensed version of the most advantageous gear design formula.

- 6. Multiple Outlet Gear Pump. Particularly suited to applications where several circuits of liquids or lubricants are required to work separately and independently of counter pressures, Model Z3U multiple outlet gear pump manufactured by Nathan Mfg. Corp., Dept. BM, 45-02 Ditmars Blvd., Long Island City 5, N.Y., is described in a new bulletin. The pump is available with from two to six outlets and in different sizes depending upon the amount of lubricant required. Uses include circulating lubrication of large diesel motors, gear reduction units and machine tools.
- 7. Milling Machines. The importer of the Fritz Werner, Berlin, U.S. Zone Germany, A-G Milling Machines, the Marac Machinery Corp., Dept. TM, 45 S. Broadway, Yonkers, N.Y., has issued a 14-page catalogue covering sizes 2, 3, and 4. Specifications for plain, universal, and vertical millers in the above sizes are included with comprehensive descriptions of each.
- 8. Profile Milling Machine equipped with vertical head for profile milling and vertical face milling head for tapered sheets and structures is the subject of Bulletin 1140 released by Onsrud Machine Works, Inc., 3903 Palmer St., Chicago 47, Ill. InvOmil A-72 is completely analyzed—excellent photographs of full machine and featured components aid in clarifying text. Outside and inside milling operations and typical parts milled are also illustrated to demonstrate fully the travel and movement of the InvOmil head.

- 9. Heavy Duty Vertical Miller. Featuring outstanding performance, economy and accuracy, and greater operating speed the new improved heavy-duty Duff vertical miller, Model 20H, is pictured in a brochure released by Duff Machine Co., Dept. B, 31 Wingate St., Haverhill, Mass. Specifications are also given for universal milling attachment.
- 10. Super-Spaces eliminate expensive jigs and fixtures! It is basically a heavy turret on which is mounted a hardened and ground precision index plate and a self-centering chuck or other work holding means. How it drills, mills, grinds, bores, etc. without jigs and fixtures is explained in an 18-page Bulletin S-104 issued by Machine Tool Accessory Division, The Hartford Special Machinery Co., 287 Homestead Ave., Hartford 12, Conn.
- 11. Lathes at Work. Twenty-five Gisholt machines will be at work at the September Machine Tool Show. Bulletin 7-855 is a pre-show issue of Production Pointers from Gisholt showing what their new and improved series of machines will do. Jetracer, Fastermatic, Electram, Superfinishers, and Simplimatic are identified with greater power, higher speeds, faster changeovers and simpler maintenance. Gisholt Mfg. Co., Dept. MT, Madison 10, Wis.
- 12. 32-Inch Lathe. Developed for the purpose of reducing the cost of turning operations by cutting the cost of each cubic inch of metal removed to a new minimum, the latest addition to the Pacemaker line, "American" Style "H" lathe is illustrated and described in detail in Bulletin No. 26-5M. Ease of control is an outstanding characteristic; the quick change gear mechanism, producing a wide range of threads and feeds, is quick acting, easily understood, and free from complications. American Tool Works Co., Pearl St. and Eggleston Ave., Cincinnati 2, Ohio.



UNISORB

eliminate costly floor drilling reduce vibration and noise anchor heavy machinery."

You eliminate up to 85% of transmitted vibration and noise when you install machinery on UNISORB. You save time and money on installation because there is no floor drilling with UNISORB. UNISORB cement firmly holds UNISORB pads to machine feet and floor.

You Reduce VIBRATION NOISE MAINTENANCE

with UNISORB Mountings

- no bolts, no lag screws, no holes to be drilled, no floor damage.
- UNISORB adhesive holds for keeps, yet permits re-positioning of machines. (UNISORB booklet tells you how.)

For complete information about this simplified machine installation method, return the coupon and ask for a copy of the

UNISORB booklet.



Please send my free copy of the booklet containing the complete story of UNISORB Mounting.

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COMPANY

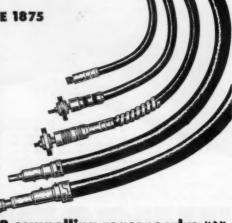
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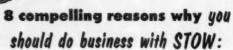
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Flexible Shafts and Flexible Shaft A Hachines

JT 38-Jiffy Tool. Constant

speed machine





1. **DEPENDABILITY**—Stow Engineers are flexible shaft specialists.

EXPERIENCE—Stow is the oldest and largest producer of flexible shafting in all sizes.

3. COMPLETE SIZE RANGE—From 1/8" to 15%" cores—up to 1500 lb. in. for power drives or 4000 lb. in. for remote control.

4. STANDARD power drive shafts available.

5. FOUR STANDARD types of cases. Special cases can be furnished to meet your requirements.

LARGE VARIETY of standard terminal parts available.

SPECIAL terminal parts can be made to your specifications.

8. ENGINEERING SERVICE—Your inquiry will receive prompt and careful consideration by TOP flexible shaft engineers.

N40 Streamliner—One of a complete line of STOW flexible shaft machines. Write today for Catalog 51.

> STOW MANUFACTURING CO. 30 Shear St., Binghamton, N.Y.



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13. Bliss Trends is a quarterly publication of E. W. Bliss Co., Dept. TM, Canton, Ohio. Interested readers may obtain the Spring 1955 issue which features the 7000-ton Bliss hydro-dynamic press by requesting same. Previews of new products—presses, clutches, and scroll shears—are included in this issue.

14. Small Punch Press. Increased tonnage capacities are claimed for a brand new line of Benchmaster punch presses. New design and engineering features of five Benchmasters are described in a bulletin released by Benchmaster, Dept. BB, 1835 W. Rosecrans Ave., Gardena, Calif. Brief descriptions of other company products and punch press accessories are included.

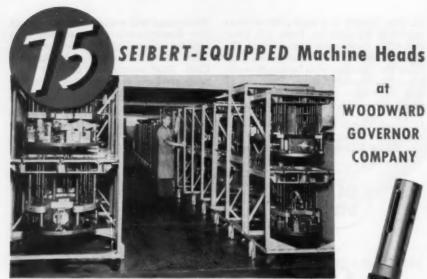
15. Flexible - Power Presses with Air Controlled flexible clutch are being manufactured by General Manufacturing Co., Dept. B, 6430 Farnsworth Ave.,



Stop dust quickly, at lower cost, with Dustkop. Thirty-seven standard models ready to use and available from stock. Dustkop conserves floor space, reduces maintenance. Collects almost all types of industrial dusts. Write for descriptive literature.

Also a complete line of Mist Collectors

AGET MANUFACTURING COMPANY
1402 East Church St. . Adrian, Michigan



at WOODWARD GOVERNOR COMPANY

Simplify Tooling Changeovers . . . Help Build Precision Parts Faster

At Woodward Governor Co., Rockford, Ill., an ingenious method of machine head storage reduces setup time and minimizes damage to spindles and tools. The main illustration above shows how 75 interchangeable heads, equipped with more than 1500 Seibert precision-built spindles, are neatly arranged and numbered to permit fast and easy removal in and out of storage to machine location. Woodward Governor, another company whose production requires precision tolerances and high quality, has been using Seibert tools for more than 5 years.

3 Reasons Why Users Specify SEIBERT

Investigate the 3 reasons why users specify Seibert tools. You will find they meet exacting tolerance requirements . . . you save money for Seibert tools are lot produced in a wide range of standard sizes . . . and your orders receive prompt handling because Seibert specializes in production tools only.



FREE DATA

Write for Folio 1-50 illustrating and describing the complete line of Seibert Multiple Drill Spindles.







Joints





SEIBERT & SON, INC. CHENOA, ILLINOIS

Quality MULTIPLE DRILL SPINDLES AND PRODUCTION TOOLS



· Zagar pallet-type transfer machine uses Zagar Feed Units at eight double machining stations, performing 16 operations with 224 spindles to ream, drill and tap cast alloy typewriter frames.



FEED UNITS now!



Write for new technical data sheets "B-10"



Flexibility at the highest! Zagar Feed Units can be adapted to any number of profitable applications. They're fast, accurate, time-saving, space-saving. You'll save handsomely on tooling costs; you can re-tool in a matter of minutes. On every job, Zagar Feed Units give you the benefits of:

- Single-slide design
- Long stroke
- Maximum h. p. − 7½
- Standard basic tank
- Stock delivery

Zagar Feed Units are designed to conform to J. I. C. standards. We can provide complete tooling plans for drilling, tapping, and reaming on close centers from any angle. Phone the nearest Zagar representative or Cleveland.



TOOLS FOR INDUSTRY and SPECIAL MACHINERY

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Detroit 11, Michigan. Bulletin 407 describes the 15 ton press which provides effortless operation for production straightening, assembling, cold riveting, forcing, staking, and testing. Pressure needed for each size part is dialed.

16. Power Presses. How to figure press tonnage requirements is explained in a 12-page catalog featuring the 4-clutch type Famco power presses. The Famco Machine Co., 3132 Sheridan Road, Ke-

nosha, Wisconsin, manufactures 50 models ranging from 4-ton to 18-ton sizes, in both bench and floor models. Presses illustrated and described, also a number of precision parts used in presses.

17. Ball Lock Punches. A wall chart has been incorporated in a 4-page catalog issued to introduce the complete line of ball lock punches and a new finishing process for the punches—Lubri-Finished



FIRST...In Experience • In Know-how

- In Research In Quality
- In Service

The sketch briefly describes the cost of a typical part made for one of our thousands of customers.

We have a short run stamping service to offer beyond comparison.

EXAMPLE



\$63.20 for first 100 pieces including tools. \$5.20 for each

\$5.20 for each additional 100 pieces plus material.



Factory trained representatives in all centers. Write for full details.

DAYTON ROGERS
Manufacturing Company

MINNEAPOLIS 7C, MINN.

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MACHINE and TOOL BLUE BOOK

—manufactured by Accurate Bushing Co., 443 North Ave., Garwood, N.J. A complete chart of sizes, costs, and competitive equivalents are given for regular, heavy duty and extra heavy duty punches.

18. Precision Boring Heads. Newest development in boring heads—the Maxwell E-Z set—is adequately described in a six-page folder released by The Maxwell Company, Dept, B, 386 Broad-

way, Bedford, Ohio. The simplicity of design shown by actual photographs and line drawings is claimed to permit greater strength. Specifications for six models given.

19. Heavy-Duty Vise. Specially hardened and ground guide rails and jaw plates featured on Producto Heavy Duty Six-Inch Vise—plain and swivel types —prevent destruction by milling or drilling into jaws or body of vise. Bul-



DARL BASE



FOR MORE ACCURATE MACHINING

Fiske "DARL" Oil is a base cutting oil that has real flexibility. Fiske's "DARL" can be used straight or reduced with mineral oil to the degree suitable for the tool, the work and the metal. "DARL" works both ferrous and non-ferrous metals. It is non-corrosive, and permits visibility when mixed. Having exceptional anti-weld value, lubricity and high film strength, it is excellent in drawing and stamping, as well as for machining. Standardize with "DARL" and save money.

Information on each of the many Fiske Lubricating Specialties is available in bulletin form. Send for bulletins describing lubricants of interest to you.



FISKE BROTHERS REFINING CO.

Newark 5, N. J. and Toledo 5, Ohio

METAL WORKING LUBRICANTS

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letin TE2-104 pictures three types of vises, gives information on attachments, and includes specifications. The Producto Machine Co., Dept. BM, 990 Housatonic Ave., Bridgeport 1, Conn.

20. Guide Pin Bushings. Working to closer tolerances as well as extending the life of dies is claimed for the bushings illustrated in Price List B6 released by Lamina Dies and Tools, Inc., Dept. MT, P.O. Box 31, Royal Oak,

Michigan. The wring fit principle is one of the most important phases in using the Lamina type bushing, whether it is the steel, solid bronze, and particularly the bronze plated type. Toe clamp type guide bushings, nut type, and ring clamp type are illustrated. Each style diagrammed. Specifications given.

21. Welding Head. Designed for rapid, precision welding of small parts and

HERE'S A TYPICAL HOLDING JOB CONTROL CONTROL

HOW MANY MORE DO YOU HAVE?

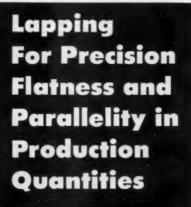
Here the new Jacobs Model 96 Rubber-Flex Collet Chuck holds a machined part for inspection.

We don't yet know all the applications for this marvelous holding device. We do know it is the most accurate collet chuck in the world... that it holds any piece from $\frac{1}{16}$ " to $\frac{1}{16}$ " in diameter using only 11 collets, and has a gripping power unmatched by any split steel collets.

What are your work holding jobs for Model 96? Get the

details on this great chuck from your industrial distributor, or write The Jacobs Manufacturing Co., 2210 Jacobs Road, West Hartford 10, Conn. Ask for Bulletin 54-CC.







LAPMASTER

This is the machine for you if you want precision flatness in production quantities at low cost. Lapmasters readily lapties at low cost. Lapmasters readily lapties to the extreme close tolerance of one light band (0000116") or less. In addition they produce an extremely fine finish to as low as 1 RMS. They are available with 12", 24", 48", 72" or 84" lapping plates.

THIS IS NOW THE LAPMASTER WORKS

I, a heavy cast iron lap plate revolved slowly under power.

II, large cast iron conditioning rings are held in position and rotate freely on the lap. III, work pieces are placed inside the conditioning ring where they also rotate on the lap. IV, a liquid vehicle containing fine loose abrasive flows on the lap plate and is uniformly distributed under the work pieces. At the same time the rotating conditioning rings preserve the flatness of the lap plate. These three essential features, combined with the rapid cutting action of loose abrasive produces a flatness which meets every production requirement.



Operator requires no previous lapping experience.



Lapping with loose abrasive and without excessive pressure eliminates heat and subsequent distortion.



Simplicity of design provides accessibility and allows ease of loading and unloading.



Lease abrasive distributed evenly over lapping area insured uniforn



Precision laps identical parts in one cycle or parts of various shapes, heights

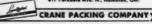


Lap plate always kept in condition while in operation. No down time required for truing or reconditioning.



Learn more about the possibilities of production lapping and the interesting subject of measuring flatness. The illustrated fact-filled booklets are yours for the asking. Write today. BB-2

CRANE PACKING COMPANY
1812 Cuyler Ave., Chicage 13, III.
In Camada: Crane Packing Campany Ltd.
617 Parkdale Ave. N., Hamilton, Ont.





sub-assemblies The Raytheon Model J welding head is fully described in a pamphlet (PD2 - 201) issued by the Equipment Marketing Division, Dept. BB, Raytheon Mfg. Co., 100 River St., Waltham 54, Mass. Design features, operation, and specifications aid in the evaluation of the product.

22. Power Tube Flarer. The Parker Model 232B power tube flarer is an electric motor driven machine for easy,

speedy production flaring of annealed seamless copper, aluminum, steel or stainless steel tubing. With readily interchangeable heads and accessory attachments, it can be used also for squaring-burring and beading of tubing. Completely legended photographs of the machine aid in clarifying the text which includes operating instructions for 37° or AN flaring, squaring and burring, and beading of tubing. Catalog 1145A12 is available from Tube and Hose Fitting



Division, The Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio.

23. Wire Straightening and Cut-Off Machine. Electrically controlled target and clutch! Design advantages of the 1AV Shuster automatic wire straightening and cutting machine manufactured by Mettler Machine Tool, Inc., Dept. MB, 19 Congress Ave., New Haven, Conn., are listed in Bulletin No. 53.

24. Coil Handling and Feeding Equipment. Two unique features of a new catalog issued by Automatic Feeds Co., Dept. MB, Napoleon, Ohio, include a sheet outlining specific information to be given when requesting quotations on machine requirements and a glossary of various terms used throughout the catalog. Short descriptions and drawings of various types of machines manufactured are used as an introduction.

FIRST 8-INCH METAL CUTTING SAW TO MEET TODAY'S NEEDS



KALAMAZOO

Kalamazoo Metal Cutting Band Saw Ma-

KALAMATIC BAR FEED for Kalamazoo.

MODEL 1220 cuts 12" round, 20" flat.

MODEL 610 cuts 6" round, 10" flat.

MODEL 8C

cuts 8" round, 16" flat, 8" pipe

Instant-acting vise holds work-piece. Four speeds for best cutting. Accuracy easily controlled—blade action in cut easy to see. Blades changed in seconds. Automatic shut-off. All parts readily accessible. Ask your Kalamazoo dealer to demonstrate Model 8C.

MACHINE TOOL DIVISION

Kalamazoo TANK and SILO CO.

1032 Harrison St.

Kalamazoo, Michigan

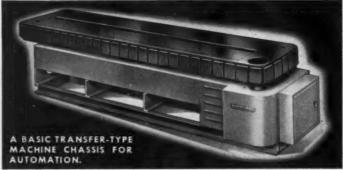
Standard features of specific machines are listed in brief form under descriptions and photographs,

25. Chilling Equipment and industrial temperature testing units are described in a 12-page Bulletin 102 (Rev.) concerned with uses of Cincinnati Sub-Zero Products, 3930-P4 Reading Rd., Cincinnati 29, Ohio. Shrink-fit assembly of metal parts, metal treatment through

chilling, gas dehydration and metal and material testing are a few of the many industrial operations performed by the equipment.

26. Heat Treating Units. The purpose of Bulletin T-40 released by Ipsen Industries, Inc., Dept. B, 715 S. Main St., Rockford, Illinois, is to describe Ipsen Series TFC automatic heat treating units with controlled atmosphere cool-

Swanson Announces... the AUTO-TRAN unit



This versatile, transfer-type indexing chassis is available in standard models with 48, 54, 60, 66 or 72 carriers; 3", 6", 9" or 12" index travel; vertical or horizontal mounting surfaces on carriers.



also offers standard turret indexing units, with turret diameters from 20" to 72" and a complete range of indexing rotes and dwell times.

If an automation program is in your plans, write, wire or phone for full details on these Swanson standard components.



ENGINEERS AND BUILDERS OF AUTOMATIC AND SPECIAL PURPOSE MACHINES

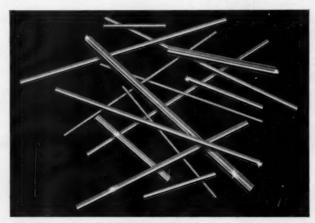
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ing featuring multiple cooling zones under protective atmospheres for carburizing, carbonitriding, normalizing, annealing, stress relieving and brazing. Descriptive drawings and photographs aid in clarifying text.

27. Protective Coatings. Information on 14 types of coatings used widely to protect equipment, walls, beams and ceilings in plants where fumes and indus-

trial atmospheres cause corrosion is included in a 19-page report on "Comparative Properties of Protective Coatings." Comparative value of the various coatings is shown by chart. The Atlas Mineral Products Co., Dept. MT, 121 Norman St., Mertztown, Pa.

28. Fork Lift Trucks. Job Study No. 145, a certified survey by Towmotor Corporation, Dept. MT, 1226 E. 152nd



Uses For

Available now in 148 low-cost standard sizes to meet your exact requirements!

HARDENED H. S. S. DRILL BLANKS!

"Versatile!" Yes, that's one word for Ace Drill Blanks. And "economical" is another. Because they're "all-purpose" tools that you can readily use in countless different ways. Properly heat-treated to uniform hardness, then precision ground to size, they're ideal as punches, dowels, knock-out pins, and gages. Perfect for rollers, too, on high temperature applications. And you'll find they can be quickly, easily, economically adapted to a wide range of end-cutting tool applications to save time, step up production, and reduce costs! Call your distributor today!

A 56 PAGE, illustrated catalog (No. 52-G) containing complete information on the entire line of ACE Drills and hardened H. S. S. drill blanks is yours for the asking. Send for it today!







ERE'S versatility that pays dividends. For the Fellows 36-Type Gear Shaper has real "earning power"... whether used to handle virtually every job that comes up in a small gear department...or concentrated upon the heavy work in a large production shop.

A powerful, ruggedly constructed, heavy duty machine, the 36-Type can take extra heavy cuts at high speed...yet hold close limits. Low set-up time, fast gear-shift change from heavy to fine feed, quick dial adjustment from one cutter-spindle speed to another... these are just a few of the ways the 36-Type keeps down costs.

Ask your Fellows Representative to explain all the profit-making advantages built into the 36-Type...as well as the Fellows Plan for deferred payment.

Write, wire or phone any Fellows Office!

THE FELLOWS GEAR SHAPER CO., Head Office and Export Dept., 78 River St., Springfield, Vermont

Branch Offices: 319 Fisher Building, Detroit 2 • 5835 West North Avenue, Chicago 39

2206 Empire State Building, New York 1 • 6214 West Manchester Avenue, Los Angeles 45



US Gear Production Equipment

St., Cleveland 10, Ohio, shows how a manufacturer solved truck loading, transporting, and storing problems. Complete details will interest manufacturers who handle heavy bulky materials.

29. Hand Lift Trucks. The current trend toward moving materials in heavier loads to reduce handling costs has been recognized by Barrett - Cravens Co., Dept. MT, 628 Dundee Road, North-

brook, Ill. R Model truck has been increased from 3500 to 4000 pounds. Complete specifications on all models available are given; line drawings showing distinctive features and operating views will benefit manufacturers who need to handle products economically. Bulletin 555-1.

 Spot Welding. A 12-page booklet from Air Reduction Sales Company, Dept. MB, 60 E. 42nd St., New York 17,





Progressive plants everywhere prefer Johnsons because of their greater efficiency, speed, extreme accuracy and dependability. Model J is the one outstanding cutoff saw that assures users the most in labor saving and high production at a surprisingly low investment cost. The most modern machine offered today. Compare its advanced features, its CAPACITY, STRENGTH, 3-POINT SUSPENSION AND SAFETY and you'll buy a Johnson Saw.

Wet Model for Production Cutting—Dry Model for Run-of-Mill Cutting

JOHNSON MANUFACTURING CORP.

Encircle No. 283 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

More Production, More Profit BY BROACHING...



Internal broaching of a cam ring. Note the complexity of the ring design. The steel is soft and tends to tear, yet this Continental Broach sizes the I.D. and cuts 8 splines 5/16" deep in one pass.

REMOVE STOCK TO PRECISION LIMITS — FAST ... ROUGH AND FINISH IN ONE PASS!

The scope of Broaching has broadened in recent years. Many broaching operations do precision work in far less time than other metal-cutting methods.

Continental Engineers have for years been designing all types of cutting tools and broaches. They can recommend without bias your most economical way to do the work.

For facts about increasing your production by broaching, call in your local Ex-Cell-O representative—or write Continental in Detroit for Cutting Tool Catalog.

C Continenta CTW

DIVISION OF PEX-CELL-B CORPORATION DETROIT 32, MICH.

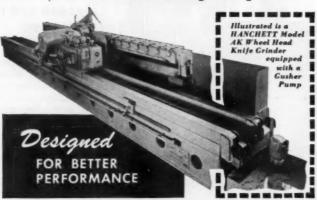
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N.Y. describes Aircospot, Air Reduction's inert-gas-shielded tungsten-arc spot welding process. Over 30 tables. Weld cross-section and application photographs, drawings and graphs are included in the booklet. Sections are devoted to "when to consider spot welding from one side," "how the equipment operates," "standards and test procedures," "factors affecting weld quality" and "applications."

31. Inquiry Response and Follow-Up System. Bulletin No. 552 issued by Advertising Controls Inc., Dept. MB, 2330 Victory Pky., Cincinnati 6, O., describes a new tool which provides exact control of the all-important activity of "handling" prospects who have voluntarily expressed an interest in your product through inquiry.

32. Stainless Fasteners. A comprehensive eight-page brochure describing

Ruthman GUSHER coolant pumps



Ruthman Gusher Coolant Pumps offer you simple yet sturdy design features. There are no friction seals or packing. The Gusher is always primed, gravity insures immediate pump action. Pre-lubricated heavy-duty ball-bearings require no further attention and the dynamically balanced rotating shaft eliminates vibration. Specify Gusher Pumps for better performance.

THE RUTHMAN MACHINERY CO.

1816 READING ROAD

CINCINNATI, OHIO

Encircle No. 385 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

FIRST CLASS
PERMIT NO. 272
SEC. 34.9, P. L. 6 R.
WHEATON, ILLINOIS

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READERS' SERVICE DIVISION

WHEATON, ILLINOIS

MACHINE and TOOL BLUE BOOK OCT., 1955 Please send the following literature which I have encircled below: 9 10 11 12 13 14 15 18 19 20 21 22 23 24 25 26 27 28 29 30 31 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 NAME POSITION.... COMPANY STREET CITY...... ZONE...... STATE...... Tear Off and Mail These Postage-Paid Postal Cards MACHINE and TOOL BLUE BOOK OCT., 1955 Please send the following literature which I have encircled below: 9 10 11 12 13 14 15 16 7 22 23 24 25 26 27 18 19 20 21 28 29 30 31 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 NAME POSITION.... COMPANY STREET CITY...... ZONE..... STATE.....



NOW... PORTING TOOLS

Available from Stock

AND-10050 -

Send for valuable data sheet A complete line of carbide tipped combination ream, counterbore and facing tools to form AND-10050 standards. Tube sizes 2 through 24 in turret lathe and drill press types. Special tools made to order.

WETMORE TOOL & ENGINEERING CO.

Engineers Designers Manufacturers
5318 E. Washington Blvd., Los Angeles 22, Calif. AN 9-7266

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save set-up time and money

Forget bolts and clamps — use these tools for firm magnetic clamping on welding or assembly jobs and save a pair of hands.

instantly adjustable to any angle



MAGNETIC ADJUSTABLE LINKS

For descriptive literature and address of sales agent in your area, write to

JAMES NEILL & CO. (U.S.A.) LTD. 37/39 PEARL STREET, NEW YORK 4.





stainless fastener styles and sizes in stock has just been released by Allmetal Screw Products Co., Inc., Dept. MTB, 821 Stewart Ave., Garden City, N.Y. Included are data and illustrations of screws, bolts, nuts, washers, rivets, "AN" fasteners, nails, pins, etc.

33. Magnetic Tools. Magnetic nut running and screwdriving tools, using permanent magnets to provide the magnetic force to hold nuts and screws in driving position, are described in Catalog 25, published by the Apex Machine & Tool Co., 1028 S. Patterson Blvd., Dayton 2, O. Also included are magnetic sockets, bolt clearance type magnetic sockets, reversible magnetic sockets and magnetic sockets for straight and angle grease fittings.

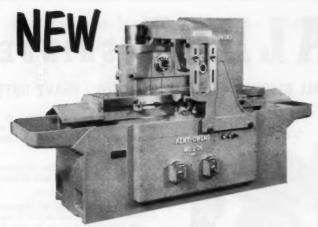
34. Milling Machines. A new bulletin illustrating and describing the new



Axelson models 10R ram turret vertical milling machine and 10RH ram turret duplex milling machine has been announced by the Axelson Mfg. Co., Div. of U.S. Industries, Inc., Dept. BB, 6160 S. Boyle Ave., Los Angeles 58, Cal.

35. Multiple-Spindle Drilling Machines Type W Two and three way hydraulic multiple-spindle drilling machines; power units, cam or hydraulic feed; boring, drilling, tapping machines; radial arm tapping machines; transfer machines; universal joints and worm gears are all described and illustrated in a series of booklets issued by the Baush Machine Tool Co., Dept. MB, Springfield 7. Mass.

36. Levers. New, illustrated 16-page bulletin HW-B3, issued by Batavia Metal Products Corp., Dept. MTB, Batavia,



No. 3-36 HYDRAULIC MILLING MACHINE

Now the new No. 3-36 in the Kent-Owens line of Milling Machines offers you the same unexcelled milling accuracy, speed and dependability for *larger size work*.

This ruggedly constructed miller has 36" table travel...64" x 16" table...full automatic hydraulic feed. Write for full specifications. Kent-Owens Machine Co., Toledo, Ohio.

Call on KENT-OWENS

for MILLING MACHINES

Encircle No. 389 on Card, Opposite Page 65

N.Y., presents the Batavia line of levers and control units. Including a photographic chart to show how special levers are assembled from standard forgings, the bulletin contains detailed drawings, product illustrations and application photos.

37. Ball Screws. Beaver Precision Products, Inc., Dept. MTB, 651 N. Rochester Rd., Clawson, Mich., have prepared a brochure on the subject of: "How to apply this highly efficient method of torque-thrust conversion to your actuation problem." Load capacities, design standards, design considerations, typical nut adaptors, etc., are described and illustrated.

38. Roller Conveyors. A new catalog on Series 60 medium and heavy duty roller conveyors has just been issued by The

BALDOR GRINDERS

BALL BEARING - TOTALLY ENCLOSED - HEAVY DUTY



Baldor Grinders are available in bench and pedestal types with 6" to 12" wheels. Baldor Grinders are better because:

More Rugged — Arber diameter %" and "sealed-for-life" ball bearing Size .05.

More Versatile — Wide clearance between wheels and motor frame permits grinding of large or odd shaped pieces.

Baldor is a basic manufacturer of grinders—even the motors are built by Baldor.



Baldor 10" Series Grinder ¾ h.p., 1 phase, 60 cy., 1725 rpm, 10" wheel. \$134.00

Special Carbide Tool Grinder built especially for sharpening carbide tools quickly and accurately. Reversible ½ h.p., motor withstands repeated overloads. \$149.00.

BALDOR ELECTRIC COMPANY 4368 DUNCAN AVE. ST. LOUIS 10, MO.

Encircle No. 390 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

E. W. Buschman Co., Inc., Dept. MTB, Clifton and Spring Grove Ave., Cincinnati 32, O. Twenty pages of data and specifications on the complete line describe the various types giving capacities of rollers and bearings.

39. Mining Machine Bits. The Carmet Div. of Allegheny Ludlum Steel Corp., Dept. MB, 2020 Oliver Bldg., Pittsburgh 22, Pa., has published a leaflet describing a new line of mining machine bits known as G and H series. Lower tool cost and reduced down time are discussed and illustrated in this leaflet.

40. Specialty Steels. A new 32-page illustrated guide to specialty steels is available to all steel users. Issued by the Carpenter Steel Co., 314 W. Bern St., Reading, Pa., the booklet defines the distinctive characteristics of a broad



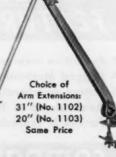
Hir-Coled

Dazors

with Side-Mounted Reflectors







Now it's as easy to beam light into a recess, or around an offset, as onto a simple tool or bench position. This Adjustable-Arm Dazor with side-mounted reflector offers same low-cost air-cooled efficiency and positive tension control as top-mounted style. Uses 60-w bulb. Call your Dazor distributor. Dazor Manufacturing Corp. St. Louis 10, Missouri.



... Makers of

DAZOR FLOATING LAMPS

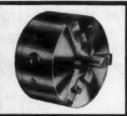
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range of special purpose steels in terms of end use. It briefly summarizes the company's specialty product line, covering tool and die steels; stainless steels; silicon and high nickel electrical alloys; special purpose alloy steels; valve, heat-resisting and super alloy steels, tubing and pipe in various analyses and fine wire specialties.

41. Chilling and Testing Equipment. Shrink-fit assembly of metal parts, metal treatment through chilling, gas dehydration and metal and material testing are described in a new 12-page catalog issued by Cincinnati Sub-Zero Products, Dept. MB, Reading Rd. at Paddock, Cincinnati 29, O. Illustrated are seven models of chilling machines and four models of industrial temperature testing units.

42. Arcast Molybdenum. A compilation of all available technical and fabricating

HORTON Tru-Set FEATURES



- Repetitive accuracy to .0002" T.I.R. guaranteed
- Rugged Meehanite bodies guaranteed for life
- Instant peripheral location 3 operating pinions
- Available up to 12" in both 3 and 6 jaw styles
- Packed in reuseable airtight metal containers

compare
HORTON
Tru-Set
PRICES

SIZE	MODEL	NET PRICE
3	3T3	47.00
4	4T3	49.55
5	5T3	66.05
6	6T3	88.90
8	8T3	128.30
10	10T3	184.15
12	12T3	222.25

Chucks listed above are 3 jaw universal type with two sets of jaws. See your Horton Distributor or write direct for new Net Price Selector

HORTON CHUCK

WINDSOR LOCKS, CONN.

data on arcast molybdenum is presented in a 72-page booklet just published by Climax Molybdenum Co., Dept. BB, 500 Fifth Ave., New York 36, N.Y. It is designed to provide those interested in the high temperature applications of molybdenum with a complete picture of where it stands today and possible uses in the near future.

43. Tool Steels. Crucible Steel Co. of

America, Dept. MBB, P.O. Box 88, Pittsburgh 30, Pa., has announced a revised 44-page book entitled "Tool Steels for the Non-Metallurgist." It describes the six basic classifications of tool steels, properties of the various tool steels and general recommendations as to which type of application is most suitable for each classification. The book also includes tables and discusses heat treating techniques.



Send NOW for additional information on how YOU can increase YOUR production without additional equipment!

Drill — ream — countersink and counterbore, all on one drill press without setting up for each operation. A simple rotation of this turret head brings any one of four drills or cutting tools into position. Accurate — fast — economical! Try Quadrill — it will earn you more profit thru less production cost.



CHICAGO QUADRILL

-Company

1846 BUSSE HIGHWAY, DESPLAINES, ILLINOIS

SHELDON STIAN 13" NEW Sebastian 13" A-5 GEARED HEAD



Speed changes easily made by revolving speed dial on headstock



Heavy, multiple Splined Spindle with "Zero Precision" tapered roller bearings



Quick change Gear bax provides 60 different threads or feeds — has built-in lead screw reverse



Massive 1-piece, double walled apren with gears running in ail has "1-shot" pressure lubrication system for carriage and ways



PRECISION LATHE -

This is a completely new Sebastian Lathe designed and built by Sheldon . . . a rugged work horse with extra power, toolroom accuracy and all the modern features that make for money-saving production . . . with all controls centrally grouped in easy reach for safe efficient operation.

Modern, heavy cast-iron pedestal (included in base price of lathe) completely encloses motor and drive . . . with storage space in tailstock leg for tools and chucks.



Cam action tailstock clamp permits rapid release and Instant locking of tailstock

Run this new Sebastian lathe. Test its performance. You will appreciate the powerful cuts that this lathe can take. Write for circulars on 13" and 15" Sebastian lathes and name of nearest dealer where you can see and operate these outstanding lathes.

SHELDON MACHINE CO., INC.

4202 N. Knox Ave., Chicago 41, Illinois

Encircle No. 394 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK



Gantry Type Milling Machine Believed to be Largest in U.S.

Portland Machine Tool Works, South Portland, Maine, has designed, built and installed what is believed to be the largest capacity milling machine in the country. It is a gantry-type mill with a work capacity of 17'x70', capable of taking a cut from the top of a

boxcar-size casting with plenty of room to spare.

The machine is hydraulically-driven, equipped with a Portland-built Power Pack and a 50 hp heavy duty milling head.

A hydraulic pressure equalizing sys-



tem, tracer controlled, prevents seesawing in the longitudinal travel of the rail along the ways. The equalizing system, wholly embodied in the rail,

is claimed to insure accuracy of .002 in parallelism throughout the 70 ft. length of the ways.

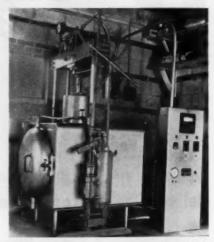
Use ACTION Card, opposite page 64. Encircle No. 1

High temperature vacuum furnace with pressure attachment

The Lockhart Research Foundation of Gary, Ind., engaged in research on photosynthesis using nuclide migration of radio active materials, has installed a new type Huppert high temperature vacuum furnace, built in conjunction with a high pressure press developing 70 tons pressure on a 5" dia. diaphragm. This type of furnace can be designed for temperatures up to 2,400° and 29" of vacuum with the temperature and vacuum automatically controlled.

Furnace is manufactured by the K. H. Huppert Co., Dept. BB, 6830 Cottage Grove Ave., Chicago 37, Ill.

Use ACTION Card, opposite page 64. Encircle No. 2





Precision lathe for manufacturing, toolmaking

Developed for both manufacturing and toolmaking applications, the Series EE, Model 1000, precision turning lathe has been announced by the Monarch Machine Tool Co., Dept. BB, Sidney, O.

The all-electric speed control mechanism offers infinitely variable cutting speeds. A single electric control knob provides any desired speed within the range selected. Four hydraulically actuated speed ranges are available and shift automatically upon the setting of a range selector switch. Both the speed control and the shift are located convenient to the operator at the apron.

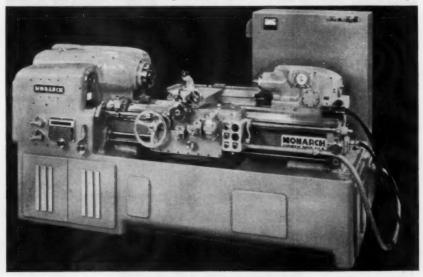
The machine also is equipped with built-in constant surface cutting speed, recommended for facing operations and multiple diameter shaft work. The operator sets the selector switch at the desired cutting speed for the part to be turned and from that point on the machine takes over, giving him that speed without further adjustment.

An electronic rectifier system, located in a separate electrical control cabinet, provides power for the machine's 20 hp, variable speed main drive motor. This system has sufficient capacity to operate the motor at 30 hp without excessive overloading. The spindle motor load meter permits the motor load to be constantly supervised.

Motor control and load compensation are handled electronically by means of vacuum tubes and relays. This system eliminates vibration and noise by avoiding revolving equipment in the power supply to the drive motor. The load compensation control keeps motor speed constant within 5% from no load to full load at any particular speed setting.

Use ACTION Card, opposite page 64. Entirels No. 3

Designed for both production and toolmaking applications, the new Series EE Model 1000 Precision Lathe announced by the Monarch Machine Tool Company features infinitely variable electric speed changes and electronic main drive motor control. The motor control cabinet (shown at right-rear) houses rectifiers, electron tube and relays.



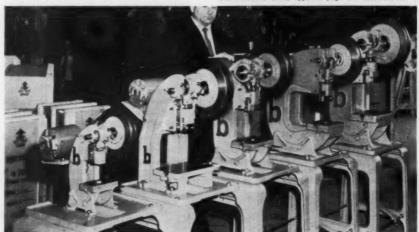
Tonnage Increased on Punch Press Line

Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif., has announced a series of five new punch press models. By redesigning, two full tons are now delivered by the former 1 ton press. The 4 ton Benchmasters now have a 5 ton capacity while the 7½ ton Model now delivers 8 tons.

Presses are available in standard OBI

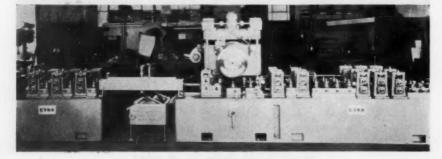
inclinable types, as well as a deep throat model, back-geared models and half-presses. Latest improvements include an oversize clutch design. The sliding key is now contained in a large steel collar taking the entire load off the crankshaft keyway. Brake size has been increased, with ram stopping on top dead-center after each stroke.

Use ACTION Card, opposite page 64. Encircle No. 4



Tube Mills Incorporate New Features

The Etna Machine Co. is incorporating several new features into its line of universal drive tube mills. Closed in fin pass stands and sizing stands minimize spindle deflection. A two motor direct drive to gear box eliminates the



necessity for chains, couplings, and jack shafts. Rotary scarfing unit provides greater accuracy.

The forming and welding sections are cross keyed and bolted at the bases for positive alignment. Universal drive provides greater accuracy in forming and allows an easier change from the manufacture of one diameter tube to another. The cluster method of forming progressively rolls the tube into shape without

excessive stretching of the edges, thereby eliminating buckling. Abbey Etna Co., Dept. MTB, 3400 Maplewood Ave., Toledo 10, O.

Use ACTION Card, opposite page 64. Encircle No. 5

Stub taps have fractional size shanks

A line of stub taps with conventional fractional size shanks for use in automatic screw and bar machines is now available from the Jarvis Corp., Dept.

MARVECO LIVE CENTERS CUT PRICES

OLD PRICE NEW PRICE

MODEL A \$4000 \$3200

MODEL AX \$4800 \$3600

MODEL B \$5200 \$4000

ATTRACTIVE TERRITORIES OPEN RELIABLE DISTRIBUTORS WANTED

MARVEL TOOL & MACH. CO. 1090 N. RIVER ROAD ST. CLAIR, MICH.



Encircle No. 397 on Card, Opposite Page 65



BBM, Middletown, Conn. Taps are available in right hand plug and bottoming styles, ground for tapping specific materials. Standard sizes: Number taps—4, 5 and 6, .1406" dia.; No. 8, .1562"; No. 10, .1875"; No. 12, .2187". In fractional sizes, the ¼" tap has a shank diameter of .250"; 5/16" and 7/16", .3125"; ¾" and ½", .375".

Use ACTION Card, opposite page 64. Encircle No. 6





Watte Today

Manufacturers of all types of fixed center and individual lead screw tapping heads. Multiple Spindle
Drill Heads have
many uses, yet
oftentimes they
are not considered
as being applicaable to automatic
turret lathes.

If you want to reduce labor costs and the number of operations requir-

ed to complete a particular part, why not see how U.S. Drill Head engineers can help.

Write or wire us today. There's no obligation, and the chances are that we can save you time and money.



UNITED STATES DRILL HEAD CO.

616-618 Burns Street, Cincinnati 4, Ohio



FOR LESS THAN \$40 YOU GET 12 SETS, EACH SET GROUND READY TO GO

Men would not accept either idea at first . . .

INSERT CHASERS SAVE UP TO 33%

Insert chasers are like safety razor blades: they cost so little that you can throw them away when dull. Or, for utmost economy, you can resharpen them over and over again. Only a flash grind is required. For less than \$40 you get a dozen sets of %—16 insert chasers, each set ground ready to go. You will be amazed at the quantity of threads they will cut, even to Class 3 specifications, with a minimum of downtime. FREE: "Unified and American Screw Thread Digest"

THE EASTERN MACHINE SCREW CORPORATION 20-40 Barclay St., New Haven, Conn.

Encircle No. 400 on Card, Opposite Page 65

Power hack saw improved

An improved Jefferson 601 power hack saw has 4"x4" capacity and will handle pipes or rounds up to 4" od, either on a straight or 45° angle cut.

Either 10" or 12" blades may be used. The saw is equipped with an automatic stop electric switch, Oilite bearings, adjustable bronze gibs in saw frame, gage bar, and latch bar for holding saw frame when not in use. Sales Service Machine



Tool Co., St. Paul, Minn.
Use ACTION Card, opposite page 64. Encircle No. 54

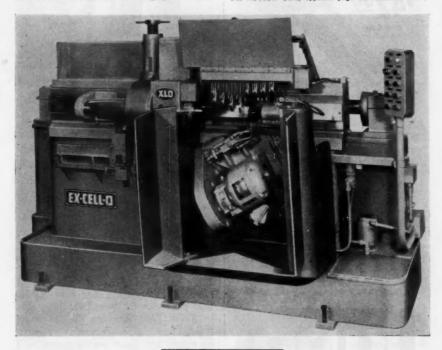
Blade profiling miller

The Ex-Cell-O Style 186 precision profile miller has a precision milling spindle with its drive motor mounted on an angular slide on the front of the machine base. It is currently being used on titanium and stainless steel airfoils of forged jet engine compressor blades. The work feeds lengthwise across the milling cutter, and indexes radially after each cutting stroke. The position of the blade relative to the cutter is maintained at all times by an accurately ground steel cam on the work head, which engages a fol-

lower on the machine base. By this arrangement the work head pivots up and down during the milling cycle to obtain the required form on the blade.

Roller type back rests are brought into contact with the work, and are locked hydraulically before each cutting stroke. These rests do not exert pressure on the blade, but they afford firm resistance to cutting pressure to prevent deflection. Ex-Cell-O Corp., Dept. JS, 1200 Oakman Blvd., Detroit 32, Mich.

Use ACTION Card, opposite page 64. Encircle No. 7



Ten-ton power press

The Famco 10 Ton standard, openback inclinable power press features extra long ram ways, increased ram adjustment, greater ram area, precisionfitted ram block, one-piece heat-treated crankshaft.

Press has a 11/4" standard stroke and



kipp

AIR GRINDERS

MODEL JA
50,000 R.P.M.

\$4200
IN U.S.A.

Weight 12 ounces, length 6½ inches, chuck size ½ inch.
Wheel guard removed

The RPM's stay up while grinding . . . not only when the grinder runs idle. That means better work—longer wheel life.

for better illustration.

High speed grinding with small wheels was a Madison-Kipp development of the late twenties. It was born out of a pressing need in our tool room. Because tool room grinding problems are universal, we believe it will pay you to utilize Kipp grinders in your tool room as generally as we do in our own.



MADISON-KIPP CORP.

207 Waubesa St., Madison 10, Wis., U.S.A.

Encircle No. 401 on Card, Opposite Page 65



a 3" maximum stroke. It operates at 190 strokes per minute and has a ¾ hp-1200 rpm motor. Famco Machine Co., Dept. RB, 3100 Sheridan Rd., Kenosha, Wis.

Use ACTION Card, opposite page 64. Encircle No. 8

Automated broaching

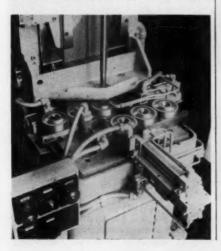
This American vertical type automatic pull down broaching machine for conveyor line operation, is equipped

MACHINE and TOOL BLUE BOOK

with electrical controls and a hydraulic broach retriever. The machine broaches the hole and involute splines in an automatic transmission clutch hub. To provide alignment of the broach, the retriever follows the broach down during a principal portion of the broaching stroke. As the broach is pulled through the part, the retriever follows at a rate which holds the broach in tension.

The machine automatically receives parts coming in from the line, broaches them, and ejects them back onto the line. Parts coming in actuate a loading cylinder which transfers a part into broaching position. A hydraulic lift lowers the part until it seats against the inner boss of the previously reamed hole. The retriever lowers the broach through the part until the shank connects with the automatic jaws of the broach puller. The part is broached, the lift raises the part and an ejection cylinder ejects the part back onto the conveyor line. The broach is then returned to the retriever and the cycle automatically repeats. American Broach & Machine Co., Dept. JS, 415 W. Huron St., Ann Arbor, Mich.

Use ACTION Card, opposite page 64. Encircle No. 9



Save Costly Regrinding!

MEW, IMPROVED HAND SCRAPER

After the original regrinding most users of this new Anderson hand scraper find that only honing is necessary. Judge for yourself: Order as many Model 5-D scrapers as you want. We'll send them promptly. Use them a full week... if they don't live up to all your expectations, send them back to us for refund.

Faster Cutting
Easier to Use
Just the Right Spring
Palm Fitting Grip
Light in Weight
18" — 20" — 22" lengths

\$5.80... with high speed steel blades

\$8.50... with carbidetipped blades

\$1.50... for rubber bumper shown below

ORDER AS MANY AS YOU NEED MONEY-BACK GUARANTEE

Indicate choice of high-speed steel or carbide-tipped blades, and 18", 20", or 22" lengths. We suggest you include rubber bumpers in your order. Write today

For Bulletin No. 10-5



ANDERSON BROS. MFG. CO. 1907 Kishwaukee St. ROCKFORD ILLINOIS

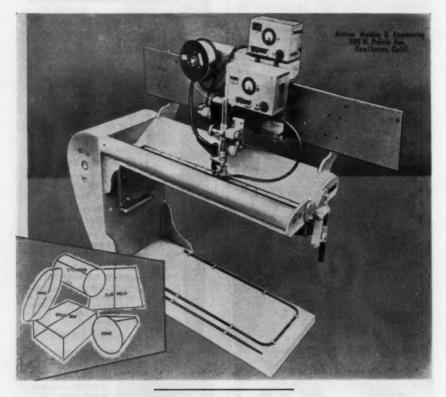
Longitudinal Welding Fixture in 2' to 12' Lengths

The Airline welding fixture Model LW Series 1000 welds flat plates, sheets, cones, cylinders, boxes, etc., with any of the fusion welding automatic processes as well as hand welding. Operator's visibility is unlimited. The unit welds .005" to 1" in thickness.

Narrow hold-down fingers pivot and are adjustable in and out. Mechanical action of fingers forces edges of parts together. Up to six copper or metal inserts in rotating back-up mandrel—choice of grooves.

"Toe Touch" foot control permits controlling fingers from any operator position. Available in lengths from 2' to 12'. Airline Welding and Engineering, Dept. BB, 785 N. Prairie Ave., Hawthorne, Calif.

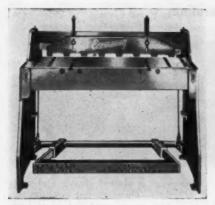
Use ACTION Card, opposite page 64. Encircle No. 10



Improved Squaring Shears

Two new models of squaring shears are being offered by Economy Tool and Gage Co., Dept. B, 4632 Lawrence Ave.,

Chicago 30, Ill., for cutting metals up to 16 and 18 gauge and other materials. One is manually powered, the other



electrically powered.

Electrically powered shear features a new worm - and - gear drive that is claimed to give greatly increased efficiency, smoother cutting action over the flywheel models.



All moving parts of shears are enclosed. Sides are of solid steel. Bearing surfaces are bronze, and manually operated shear has adjustable treadle.

Use ACTION Card, opposite page 64. Encircle No. 11



Wheel Dresser for Roughing Operations

A precision ball bearing mechanical wheel dresser, for roughing operations at a higher rate of production, has been added to the line of the Aer - O - Matic Tool Co., Dept. BB, 5059 W. Diversey Ave., Chicago 39, Ill. These dressers will open wheels for free cutting action in disc, spring and shag grinding

or wherever rougher finishes are required.

Longer life to the dresser with better grinding and less dressing are claimed to result from the 2%" outer diameter, seven 11-gauge cutter discs with spacers or nine cutter discs without spacers, and full 7/16" length of cutter teeth.

Cutters are arranged in a staggered



position on a slotted sleeve and rolls as one unit. They are not loose on the sleeve, but are secured tightly at both ends. Neither the sleeve nor the cutters come in contact with the spindle shaft. Since the bearings are lined up in the unit with one spindle shaft, there is an equal stress on both bearings, preventing the freezing of units before cut-

FOR YOUR POWER PRESS

HIGH PRODUCTION: In your power press the VOGEL TUBE SHEAR cuts any diameter or wall thickness of tubing within range of machine from 1/3 to 1 second per cut.

MINIMUM BURR: Cuts square ends with minimum of burr.

LOW MAINTENANCE: Simplicity of design with few moving parts insures low maintenance. "Set-up" can be done by anyone with very little training.

INTERCHANGEABLE: Die blocks available to cut tubing sizes from 1/8" O.D. to 2" O.D.

AUTOMATIC STOP: Holds lengths to plus or minus .010" cut from any mill lengths of tubing.

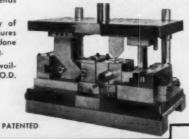
THE VOGEL TUBE

No. 12 VOGEL CUT-OFF MACHINE

Takes tubing up to 1/2" O.D. x 3/32" wall.

No. 2 VOGEL CUT-OFF MACHINE

Takes tubing up to 2" O.D. x 1/6" wall.



SEND FOR SAMPLE CUTS AND DESCRIPTIVE LITERATURE

VOGEL TOOL AND DIE

1825 N. 32nd Ave. Melrose Park, Illinois Fillmore 5-0160

Encircle No. 404 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

ters are worn. Bearings last the life of the unit. Staggered teeth afford a continuous contact with the disc, reportedly reducing required pressure, and preventing "dig and bounce."

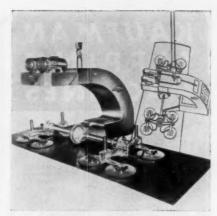
Use ACTION Card, opposite page 64. Encircle No. 12

Vacuum sheet lifter

The Littell 8-cup vacuum roll-over sheet lifter has a lifting capacity of approximately 14,000 lb. It can handle sheets of any nonporous material up to 5 feet wide by 20 feet long, weighing 2000 lb., with a 7 to 1 safety factor.

Lifter is equipped with a U-hook for attaching to an overhead crane. Lifting is accomplished by vacuum produced by two pumps. The vacuum is conveyed by tubes through a storage tank to the eight rubber cups.

There is no need for pinch bars to separate sheets or for grappling hooks for lifting the load. Sheet or plate when inverted can be carried with safety



and without dependence upon vacuum. Rotation may be stopped at any angle from horizontal to 180°, simplifying inspection of both sides of sheet. F. J. Littell Machine Co., 4147 Ravenswood Ave., Chicago 13, Ill.

Use ACTION Card, opposite page 64. Encircle No. 13

STEEL HAND and POWER

BENDING BRAKES

for Single and Quantity Runs

BENDING STEEL PLATE and SHEET METAL

Special Bending Brakes
Double Folder Brakes



MANUFACTURING COMPANY

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Built For Specific Production Jobs

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- Fast, Accurate, Rugged Index
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And Many Other Worthwhile Features

Send prints and samples of your work for further information and recommendations on how Kaufman Tapping Machines can reduce your production costs.

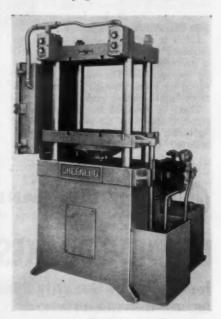
Catalogs Number 754 and 1153 Mailed on Request

KAUFMAN MFG. CO.

546 SOUTH 29TH STREET MANITOWOC, WISCONSIN Hydraulic up-acting type press

The Greenerd UA-4-10 is a selfcontained hydraulic up-acting type press with a pressure range of 11/2 to a maximum of 10 tons, which may be predeterminedly set by adjustment on the relief valve.

Size of platen, left to right 20"-front to back 14". Top and bottom plates machined with T-slots. Open daylight 18" -closed daylight 2". Platen travel on



the return stroke adjustable by mechanical control. Closing speed of platen at the rate of 157 ipm. Return speed of platen at the rate of 331 ipm. Pressure may be held on work without injury to press or hydraulic equipment. . Platen is guided on strain rods, and equipped with bronze bushings. Movement of platen is controlled by 110 volt, 60 cycle AC up and down push button station. Hydraulic cylinder is cast of Meehanite metal, bored and honed to

size, and equipped with steel piston and cast iron piston rings.

Machine is equipped with totally enclosed fan-cooled 3 hp, 1200 rpm motor and J.I.C. control panel, with 110 volt transformer operating heavy duty oiltight push button stations. Greenerd Arbor Press Co., Dept. BB, Nashua, N.H.

Use ACTION Card. eppesite page 64. Encircle No. 14

Tool holder and adapters

Universal Engineering Company's Geni holders are claimed to cut tool changing time from minutes to fractions of seconds. With these holders and adapters you need not stop the spindle to change tools.

Holder consists of a combination body and shank, a locking ring, two steel balls and retaining rings. A light push with the thumb raises the locking ring and releases the adapter. The next adapter is then inserted in the holder and the locking ring allowed to drop in place. This locks the balls in the adapter slots and provides a positive drive. Holder and adapters are self-





115 East Washington Ave., Bridgeport 8, Conn.



MILLING MACHINES DRILL PRESSES GRINDERS, SHAPERS

Built sturdy and rugged for tough heavy jobs. Accu-rately machined. IMMEDIATE DELIVERY

Complete line of Machine Tool Accessories. Write for catalog 202.

MILLING MACHINE VISES No. 40B and 60B

> 4" and 6" Jaws with or without SWIVEL BASE



CHICAGO TOOL AND ENGINEERING CO., 8384 South Chicago Avenue, Chicago 17, Illinois

Encircle No. 408 on Card, Opposite Page 65



MUMMERT-DIXON FACING HEADS with Automatic Feed

One-way Tool Feed-6, 9 and 10" sizes.

Two-way Tool Feed-9, 12, 16. 20, 24, 30, 36, 40 and 46" sizes Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

Encircle No. 409 on Card, Opposite Page 65



CUTS, BENDS, PUNCHES

Available in hand or air operated models, the MULTIFORM is shipped complete with full assortment of dies and mandrels to punch, bend and cut round or flat brass, bronze, aluminum, steel, etc., up to \(\frac{1}{6} \) "xi \(\frac{1}{6} \) "a i illustrated, other models up to \(\frac{1}{6} \) "xi \(\frac{1}{6} \)" a i illustrated, other models up to \(\frac{1}{6} \) "xi \(\frac{1}{6} \)" a illustrated.

J. A. RICHARDS CO. KALAMAZOO, MICH.

Encircle No. 410 on Card, Opposite Page 65

HALVE YOUR LIVE CENTER COSTS!

CROSS* CARBIDE-TIPPED LIVE CENTERS



HERBERT CROSS & SON 1910 BALA-CYNWYD 2. PA.

*Manufacturer of famous WEE live center.

outlive others 5 to 10 times, yet cost no more. Exclusive non-scoring carbide tip.
Permits full use of carbide cutting tools,
despite the higher speeds and increased pressures. Ball bearings in head, plus two bearings in shank, ensure needle needle bearings in shank, ensure far greater load capacity, tolerances to .0001". Available in No. 1, 2, 3, 4 and 5 Morse taper, or straight shanks; other shanks, female and special to order. Request folder, compare load ratings. Write distributes. folder, compare load ratings. Writ rect, if distributor cannot supply you.

Encircle No. 411 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

centering. As cutting pressure is applied, the taper of the adapter is seated accurately in the mating taper of the holder. Manufacturer is located at Frankenmuth, Mich.

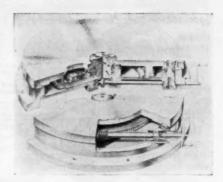
Use ACTION Card, opposite page 64. Encircle No. 15

Positive locking index tables

Sesco positive locking index tables, hand or power operated, are designed for heavy duty work—milling, drilling or any operations where vibration cannot be tolerated.

The base and top plates are both Meehanite castings, with hardened surfaces for ball races. The table runs on a hardened steel thrust ring, and a pilot is provided for locating fixtures on the table.

Both the shot pin and the locking device are actuated by one operating handle. An equalizing cam action is claimed to assure concentricity and parallelism at all times.



The top plate rotates freely and easily. A wheel and worm gear, operated through a hand wheel, provide easy movement to the top plate. Standard tables, ranging from 18" to 48" in diameter, are available with either single or double shot pin. Sesco Inc., Dept. JS, 8881 Central, Detroit 4, Mich.

Use ACTION Card, opposite page 64. Encircle No. 16

INDEXING TURNTABLES



CAMS



Eisler makes over 100 different types of indexing mechanisms for spraying, glass insulators, melting and glass glazing with rotating stations and motorized or hand operated. Retating tables of all kinds for over 35 years. We supply any part or complete equipment and we make special turntables and cams to your specifications. You are invited to see our showroom and see for yourself our many models on display. Write or call for our most models on display.

CHARLES EISLER JR., PRESIDENT EISLER ENGINEERING CO., INC., 762 So. 13th Street, Newark, N. J.

Special mandrels for unusual bore shapes

A seven jaw and a four jaw mandrel have been designed by the Le Count Tool Works Inc., Dept. MBT, 390 Capitol Ave., Hartford, Conn., to solve problems encountered with unusual internal bore shapes.

Both of these special mandrels incorporate expanding and hand manipulation features. The latter feature eliminates the need for an arbor press.



The purpose of the seven jaw special is to locate accurately in seven machined cam grooves of a hardened steel component. A stop locates component for periphery grinding.

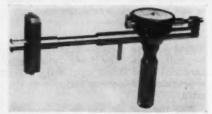
Four jaw mandrel holds a square hole die bushing for precision periphery finishing. Expanding feature permits use of the same mandrel in production on other similar though different size bushings.

Use ACTION Card, opposite page 64. Encircle No. 17

Internal groove gage head

The "Y" series gage head, for checking diameters of a wide range of 0 ring grooves, snap ring grooves and short counterbores, is now available as a stock item and will interchange with the manufacturer's standard gage heads on standard gage bodies.

Head is fast in operation and adjustment. It will read accurately to .0001"



and has a wide range of adjustment so that one piece of precision equipment will measure a variety of standard 0 ring grooves, snap ring grooves and similar internal reliefs. Will check a range of groove diameters from ¼" to 5". Rimat Tool Co., Dept. BB, 21 W. Dayton St., Pasadena 2, Calif.

Use ACTION Card, opposite page 64. Encircle No. 18

Sine-Line gear checker with 60-inch centers

A new Sine-Line involute gear checker, Model 1124-P, has been announced by Michigan Tool Co., Dept. B, 7171 E. McNichols Rd., Detroit 12, Mich. It will check involute contours and tooth spacing of gears ranging from 0 to 24 in. in diameter on shafts up to 60 in.

Only one master disc, combined with the sine-bar, is all that is needed to obtain the proper ratio between the master disc and the base diameter of the gear being checked. This is true for checking involutes on gears of any diametral pitch within the capacity of the machine.

INDICATING MICROMETER COMPARATOR 'MASTER COMPAR' ISIBLE feel has the No Arguments as to correctness of reading due to "feel". Use it as Comparator, | I" Range reading in due to "feel". Go & No Go Gage. 1" SIZE IN HARDWOOD A RIGHT HAND TOOL CASE A RIGHT HAND TOOL Release bettee for movelbe Aurils on RIGHT Hand side eachies you to held teel the conventional way. NEW—Resetting to Zero in 5 second; Quick edigstable belorence hands. Heavy TUNGSTEN CARBIER Arrill will actually measure Owl-of-Roundmass, Oveliness and Taper.

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nstration GEORGE SCHERR CO., INC. 200-MT LAFAYETTE STREET . NEW YORK 12, N.

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MODEL L-the economy, hinge-type saw in our line. 9" x 16" capacity. One-piece welded frame lowers hydraulically. Easy blade adjustment for proper cutting. Quick blade change from top

IN 11 SIZES-No. 6 to 1" N.C. In all S.A.E. sizes.

of machine. Special precision guides for longer blade life. Floor space only 20"x66". Send for FREE CATALOG today!

W. F. WELLS & SONS THREE RIVERS, MICHIGAN



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Need an Extra Hand Now to Speed Up Production! HEIMANN TRANSFER SCREW SETS Here is the faster, more precise way of transferring open and

blind screw holes—make savings in "wage-dollars-per hour" of your expensive hands on every job. A die-and-tool maker's tool with many other applications for die makers and machinists. A set of 6 Hardened Screws nested in combinetion holder and wrench-no other tools needed. Get more work now-save money too!

HEIMANN MFG., CO. URBANA, OHIO

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MILWAUKEE" Precision EQUIPMENT

SURFACE PLATES-ANGLES-PARALLELS-STRAIGHT EDGES

Made from highest grade semi-steel—de-signed and finished for true dimensional accuracy.

Write for Latest Catalog

C. BUSCH COMPANY Engineers & Machinists Since 1907

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CLIPPER PLANTED TOOKS







CLIPPER'S NEW B-XX RESIN BONDED DIA-MOND WHEELS DRASTICALLY REDUCE COSTS. FIELD TESTS PROVE: 25% MORE WEAR—FASTER CUTTING—MAINTAINS SHARP CORNERS. CLIPPER MANUFAC-TURES A COMPLETE LINE OF DIAMOND TOOLS AND WHEELS OF GUARANTEED QUALITY. PROMPT DELIVERY. ASK FOR LITERATURE.

SINGLE POINT DRESSER



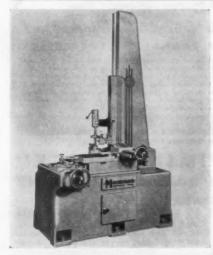
JONES & LAMSON NX-967-1

CLIPPER DIAMOND TOOL CO., INC. 21-D WEST 46 STREET, NEW YORK 36

Representatives in Principal Cities



Encircle No. 417 on Card, Opposite Page 65



A removable bracket attached to the indicator head holds fingers for checking tooth spacing. Both spur and helical gears can be checked while mounted on solid or tubular shafts. Checking of helical gears is accomplished in either normal or transverse plane. The checker is 113½ in. high and requires a floor space of 62 x 47 inches.

Use ACTION Card, opposite page 64. Encircle No. 19

Radius turning attachment

The Wade Tool Co., Dept. DR, Waltham, Mass., is now producing a newly designed radius turning attachment. With a capacity from 0 to 4", it allows the radius to be pre-set to a finished diameter.

The attachment is actuated by a worm and worm gear to give maximum control in generating spherical surfaces. Although designed primarily to be used on the Wade line of lathes, it can be used on other makes of lathes with an adaptor plate. Two tool holders, as shown, are supplied as standard equipment. The tool holder illustrated in

INCREASE PRODUCTION...



Above is shown a 6M Fen Automatic Wrench operating a 28" heavy duty chuck.

For detailed information regarding the application of the Fen Automatic Wrench to your machines, phone, wire or write.

ELIMINATE "WRENCH WRESTLING"

You can put the advantages of the Fen Automatic Wrenches to your work right in your own shop on machines already in operation, or specify them on your new standard or automatic machines.

THE FEN
MACHINE COMPANY
28914 Lakeland Blvd.
Wickliffe, Ohio

Encircle No. 418 on Card, Opposite Page 65



position is required to turn annular grooves or collars, because its shape avoids interference with the bar. The other is used for turning spherical surfaces on the end of the bar.

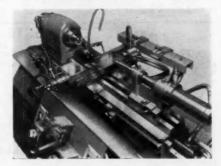
Use ACTION Card, opposite page 64. Encircle No. 20

Hydraulic Tracer lathe for small parts

The Elgin precision hydraulic tracer lathe is used to machine smaller parts in single or production quantities. It

has an 11" swing, 17" between centers and 13" carriage travel. The duplicator cross feed is 1½" and the machine incorporates a spindle drive by a countershaft clutch brake assembly designed for instant starts and stops. An air operated collet closer and tailstock work from a single selector valve. Elgin Tool Works, Inc., Dept. MTB, 1770 W. Berteau, Chicago 13, Ill.

Use ACTION Card, opposite page 64. Encircle No. 21





INA CORPORATION

401 Broadway New York, N.Y.

Encircle No. 419 on Card, Opposite Page 65



HELICALS WORM AND WORM GEARS STRAIGHT BEVELS . MEAD SCREWS . RATCHETS CLUSTER GEARS . RACKS . INTERNALS . ODD SHAPES



Encircle No. 420 on Card, Opposite Page 65

MARK and DEMAGNETIZE OPERATION



The Luma combination etchtool and demagnetizer etches, demagnetizes, anneals and solders. Permanently marks hardest steel with ease of a pencil.

Write for complete information.

Luma Electric Equipment Co. P. O. BOX 132-H TOLEDO 1, OHIO

Encircle No. 421 on Card, Opposite Page 65

CUT COSTS with ALLEN Punch Press

2-Ton Power Bench Type. Powerful, Dependable, Economical.

For light work-stamping, forming, riveting, etc-metal, fiber or other material.

Dealer Inquiry Invited

ALVA F. ALLEN

DEPT. MTB, Clinton, Mo.

Encircle No. 422 on Card, Opposite Page 65

Air clutch and brake on punch presses

Diamond Machine Tool Co., Dept. B, Pico, Calif., has announced that an air clutch and air brake are available on its open back inclinable punch presses as optional equipment in place of the standard key clutch. Air clutch is said to give smooth performance with years of trouble-free operation. There is less noise and the problem of clutch fatigue in the key is eliminated. Also claimed is a greater safety feature in preventing double tripping. Press operator has the additional advantage of an inching



operation. The travel of the ram is slowly operated and stopped in any pre-determined position while setting dies. A variable speed motor may be used in synchronizing the speed of the press with a conveyor belt or feeding mechanism.

An air brake, when used with an air clutch, is free from drag. This eliminates heat and excessive consumption of power. The air brake is timed to apply pressure for a small fraction of the stroke at the exact moment the clutch is disengaged.

Use ACTION Card, opposite page 64. Encircle No. 22



BAND-SAW MACHINE ACCESSORIES

used as standard equipment by leading band-saw manufacturers...

- CARTER RIGID
 BAND-SAW WHEELS
- JIFFY TIRES
- MICRO-GUIDES
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cut costs way down,
improve quality!

CARTER PRODUCTS CO., INC.

423 Wm. Alden Smith Bldg. 30 Ionia Ave., S.W. GRAND RAPIDS 2, MICHIGAN

Encircle No. 424 on Card, Opposite Page 65

ELEVATING TABLE



Saves TIME and ABOR

Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height from 31° to 46½°, leaving operator's hands free. Table swivels and locks in any position.

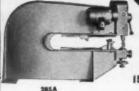
Our major services — Designing and Building — Dies, jigs, fixtures and special machinery.

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THE MIDWEST TOOL & ENG. CO. 112 WEBSTER ST., DAYTON, OHIO

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G. V. METAL WORKER



Capacities
MODELS
285-A
½ inches
400-A
15/64 inches
490-A
5/16 inches

The Multi-Purpose Machine

For use in Straight, Circle, and Free Cutting, Beading, Offsetting, Forming, Nibbling, Slotting, Louvering, Stretching, Shrinking, Etc.

TECH-PACIFIC 2811 LAFAYETTE itterature er information write:

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For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheets, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for sample and circular on company letterhead.

MICHIGAN CHROME & CHEMICAL COMPANY 8615 Grinnell Ave. - Detroit 13, Mich.

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what's your TROUBLE?

To save time and money use the

ORIGINAL-TROUBLE-DETECTOR*

for trouble shooting when damages arise or threaten to arise on machines, motors, turbines, dynamos, pumps, pipelines, etc., etc.

The ORIGINAL-TROUBLE-DETECTOR* is indispensable, reliable and a most important assistant in every work shop and plant.

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Precision Instruments 70-11 34th Avenue Jackson Heights 72, New York, N. Y.

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MICRO-HEIGHT GAUGE



NO OTHER GAUGE COMPARES FOR FAST, ACCURATE LAYOUT AND MEASURING

Capacities to 6" when used with this GREIST 3" Riser

The Micro-Height Gauge is a precision instrument, finished in satin chrome, which reads like a micrometer and measures from zero at base to 3" in thousandths. Use as a scriber for fast layout, or insert dial indicator for quick, accurate inspection.

THE GREIST MANUFACTURING CO. 447 Blake St., New Haven 15, Conn.

Encircle No. 429 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

Drill press head for small hole application

This drill press head was developed for small hole application and designed so that the basic head and mounting post can be assembled to any of the various Mico engraver bases.

It is equipped with a universal motor that belt drives the spindle assembly through a multi-stage pulley. The disstance from the mounting post to the chuck center is 6½ inches and the distance from the work base surface to the chuck is adjustable to 6 inches. A



No. 0 Jacobs chuck with a capacity from 0-5/32" is standard equipment. Mico Instrument Co., 78 Trowbridge St., Cambridge, Mass.

Use ACTION Card, opposite page 64. Encircle No. 23

Multi-purpose power cutter

The Nordex power cutter is a multipurpose machine which can easily be adapted to special operations.

It has a detachable crank case for interchanging advantages, for replacement and repair convenience. Simple and quick change of tools make it available for the following operations:



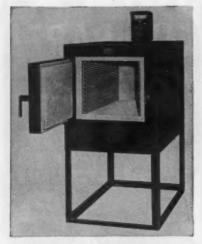
Maximum offset with Maximum Accuracy

More Flynn Boring Heads are in use today than any other make because their quality and many design features that make them easier to use and longer lived appeals to machinists.

Write for catalog



Encircle No. 430 on Card, Opposite Page 65



MORE THAN TWO THOUSAND SATISFIED USERS
WILL TESTIFY YOU

SAVE 3 WAYS WITH A LUCIFER FURNACE

1—Save on First Cost

Furnace Size	2000°	2300°
6x 6x12"	\$500.00	
9x 9x18"	750.00	
12x12x24"	1000.00	
18x18x36"	1500.00	
Complete with 100%		

2—Save on Man Hours

Less operator attention needed—Lucifer controls are EXACT. They reach SPECIFIED heat rapidly and retain SPECIFIED temperature without variation. No special experience required when you use a Lucifer Furnace.

3-Save on Maintenance

Finest refractory materials are built into Lucifer Furnaces for better, more efficient heat retention. Elements are guaranteed, long lived, trouble free

WRITE FOR FREE LITERATURE, SPECIFICATIONS AND price list of Lucifer Furnaces in wide range of sizes—top loading and side loading types. Engineering advice without obligation. Write, wire or phone today.

LUCIFER FURNACES, INC.

NESHAMINY 1, PA. Phone Osberne 5-0411

Encircle No. 431 on Card, Opposite Page 65

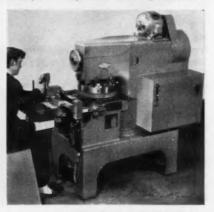


straight cutting; circle cutting; louvre cutting; beading; folding; doming. Machine comes with either a 28½" or a 48" throat and has a variable stroke adjustment. It is powered by a ¾ hp totally enclosed ball bearing motor, 110/220 V single phase, 60 cycle. Nord Corp., Dept. RS, 18 Spruce St., Nutley, N.J.

Use ACTION Card, opposite page 64. Encircle No. 24

Turret punch press

Printed wiring boards can be pierced at high speed in low to medium quantities (10 to 10,000 of a kind) with the



MACHINE and TOOL BLUE BOOK

new RA-4P turret punch press developed by the Wiedemann Machine Co., Dept. 64, 4272 Wissahickon Ave., Philadelphia 32, Pa.

Holes of any size up to 11/2" dia. are punched at the nominal rate of 80 to 120 holes per minute in printed wiring boards, terminal strips or small metal components. Holes are located to a color coded template.

In operation, the press trips automatically when the operator has depressed the hole locator so that it is positively engaged in a template hole.

Use ACTION Card, opposite page 64. Encircle No. 25

Portable compressor powers pneumatic equipment

A compact, self-contained portable electric air compressor for powering



pneumatic devices where piped compressed air is not available, the Modernair Model 100, plugs into any 110 or 220 volt ac line, delivers up to 100 psi pressure and 3.5 cfm free air. No tank or safety valve is required. Sealed ball bearings are used throughout, with no lubrication needed.

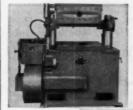
Over-all length is 13"; over-all height, 10"; weight, 40 lb. Unit is complete with built-in intake filter, 1/3 hp motor equipped with capacitor, overload protector. Modernair Corp., Dept. BTM, 400 Preda St., San Leandro, Calif.

Use ACTION Card, opposite page 64. Encircle No. 26

The modern way to tryout and finish dies is the ALPHA way



Barber, shear, fit and finish both die members without removing dies from the press. That is why you get faster, more economical production with Alpha Die Tryout Presses.



2 post press 50, 75, 100

4 post press 100, 150, 200 tons





Full details in this free, illustrated folder.

PRESS & MACHINE, INC. 9281 Freeland Ave., Detroit, 28, Mich.

Encircle No. 432 on Card, Opposite Page 65



Abart Speed Reducers are available in over 75 types and sizes—spur, worm, and combinations—ratings

from fractional to 168 hp., with ratios up to 10,000 to 1.

Specials to order

Send for free data-packed, pocket-size Abart Catalog.

ABART GEAR & MACHINE CO.

4829 West 16th Street • Chicago 50, Illinois Encircle No. 433 on Card, Opposite Page 65

Keep your tools in tip-top shape with an

OLIVER

Oilstone Tool Grinder



Check these features:

Coarse Oilstone
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General Grinding
Wheel
Grinding Cone
Stropping Wheel
Tool Holders
Direct Motor Drive

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OLIVER MACHINERY COMPANY Grand Rapids 2, Mich.

Encircle No. 434 on Card, Opposite Page 65



Encircle No. 435 on Card, Opposite Page 65

Bridgeport 5, Conn.

CE Station

MIGHTY GOOD AT ANY PRICE but TOPS AT \$69



NEW SCRAP CHOPPERS

Operated by press ram — Tool steel cutting blade.

Model M-1 takes 3" by .062 — \$69.00 Model M-2 takes 6" by .062 — \$95.00

Write for complete catalog

DURANT TOOL SUPPLY CO.

Encircle No. 436 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

"MULTI-INSULATION"

is the secret of . . .

Floor Model Furnaces HUPPERT

These sturdy production type Huppert electric furnaces not only attain highest efficiency, but also cut operating costs to a minimum through the unique Huppert method of using multi-insulation surrounding all sides of the heating chamber. Heat range—continuous up to 1850° F., intermittent operation to

1950° F., can also be built for 2300° F. operation.

This furnace comes complete with an indicating electronic temperature controller, and a tight seating, wedge-type door is used. Standardly furnished for 220 V. AC single or 3 phase operation. (110V. or 440 V. models to order).

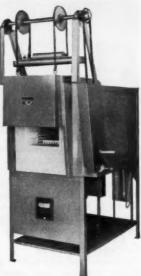
This model built in 20 different sizes.

Model No. 16 illustrated—12"x8"x18"—\$1014.00 complete
Write for literature on complete line of Huppert furnaces and ovens.

K. H. HUPPERT CO.

Manufacturers of Electric Furnaces and Ovens

Encircle No. 437 on Card, Opposite Page 65



Elevating magazine loader

The Feedall No. 4000 elevating maga-



zine loader is designed to handle short bars, studs, etc., up to 6" long. It takes the parts from the magazine, elevates them to the desired height and presents them for feeding to the next production machine.

Delivery rate can be varied from 1 to 12 pieces per minute. Unit is equipped with blade, elevating, vibratory or rotary feed as may be required. Feedall, Inc., Dept. B, Willoughby, Ohio.

Use ACTION Card. opposite 2809 64. Engirele No. 27

Hand numbering device simplified

The Stampmaster hand numbering device may be used for random or selective numbering, on all types of products where a permanent legible impression is to be applied by hand. Part numbers, heat code numbers and similar identifying data can be set up quickly by indexing individual wheels.

The unit is currently available in 3/32" and \(\frac{4}{0} \)" character sizes. Heads come in various wheel capacities. In



the interest of simplicity spring loaded retaining pawls or locking levers have been eliminated. A single locking pin which maintains stamping alignment is withdrawn to rotate wheels for setup. Noble & Westbrook Mfg. Co., 9 Westbrook St., E. Hartford 8, Conn.

Use ACTION Card, opposite page 64. Encircle No. 28

Foot-operated valve

A four-way, foot-operated air valve, Model 2800, has been added to the line of Barksdale Shear-Seal valves. Air range is up to 250 psi.

A pressure-balanced, self-aligning valve seat is in constant contact with a rotor containing flow passages. Actuation shears the flow, and the square external corner of the face wipes the rotor clean. Barksdale Valves, Dept. BB, 5125 Alcoa Ave., Los Angeles 58, Calif. Use ACTION Card, opposite page 64. Eneirtle No. 29



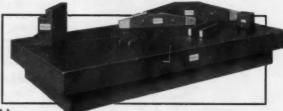


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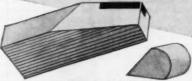
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WILLEYS TUNGSTEN CARBIDE TOOLS

From
SOUP TO NUTS
in Tungsten Carbide

 From the simplest standard tip to the most complicated tool built to your specifications or prints, Willey's service insures your complete satisfaction.

We specialize in "Specials"—so send your prints for prompt quotes and delivery dates.



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WILLEY'S CARBIDE TOOL CO.

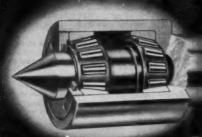
1342 WEST VERNOR HIGHWAY

DETROIT 1, MICHIGAN

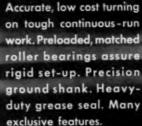
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... precision performance-ALWAYS!

Falls ROTO CENTER



tor lathe and grinder tail stocks



FREE BULLETIN 105
"What you should know about LIVE CENTERS"

FALLS PRODUCTS, INC., 122 Genoa Street, GENOA, ILL., U.S.A.

Encircle No. 440 on Card, Opposite Page 65

October, 1955

305

Spinning rivet machine forms rivets noiselessly

Available in both floor and bench models and designed for either foot or air operation, the High Speed spinning rivet machine is claimed to form perfect rivet heads noiselessly. Rivet capacity is up to 5/16" diameter, spindle travel is ¾" adjustable downward.



Inset photograph shows the spinner in use at the Automatic Voting Machine Co. in Jamestown, N.Y. Here an air operated vise holds one of the several hundred parts in each voting machine that is rivet assembled. High Speed Hammer Co., Dept. MTB, 311 Norton St., Rochester 21, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 30

New Mall

PORTABLE ELECTRIC
REVERSIBLE SCREWDRIVER



Flick of the Switch
Throws it in
Reverse

ht! It's verable!

It's lightweight! It's highly maneuverable! It drives all standard screws...and just a flick of the switch

throws it in reverse. Adjustable slip clutch gives a predetermined set to each screw driven. This versatile model is built to handle fast production work in metal or woodworking shops. Productive capacity combined with moderate price make Model 143SR a real money-saver. Try it soon in your operation.

- Handy reversible switch conveniently located for quick flick of your thumb.
- Slip clutch automatically "slips" when proper screw tension is reached.
- Adjust clutch tension quickly from outside without dismontling.
- . Built-in trigger switch in pistol grip handle.

Call or write the Mall Service Warehouse nearest you for a Free Demonstration of the Mall Reversible Screwdriver

MALL TOOL CO. PORTABLE POWER TOOLS
7742 S. Chicago Ave., Chicago 19, Illinois
Send me all the facts about the new Mall
Reversible Screwdriver.

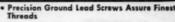
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Address_

MU-185

Encircle No. 441 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK





- · Electrically Controlled Cycle or Jog Top ping Action
- · Hand, Foot or Fixture Switch Control
- · Easily Adapted to Any Drill Press
- Range #0 to 34"



Built for high production tapping . . . precision or otherwise, the Commander Lead-Matic Tapper makes any drill press a precision tapping unit, even with inexperienced operators. Electric control of Cycle or Jog tapping action provides versatility to handle any job . . . automatic tap reversal eliminates drill press motor reversing and speeds tapping. Compact, ruggedly built, easy to operate, the Commander Lead-Matic Tapper will cut your tapping costs and reduce rejects to a minimum.

Write for illustrated circular and name of nearest Distributor

. CHICAGO PRODUCT OF COMMANDER ... BUILDER OF PRODUCTION TOOLS

Encircle No. 442 on Card, Opposite Page 65

Get three or four times MORE service out of hack saw blades

The Wardwell EC Combination Grinder re-sharpens one gross of hack or band saws at least six times—and pays for itself!

Think of the savings it will make for you.

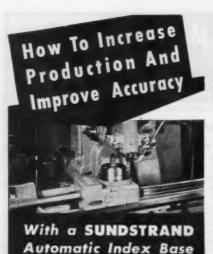
Wardwell Model EC Combination Grinder is the only single unit grinder adaptable for hack, band and circular saws that does not depend on the shape of the grinding wheel to form the shape of the tooth. This unique feature enables the operator to grind a variety of blades without dressing or changing wheels.





Write for Bulletin EC.

Makers of largest line of saw filing machines



In many cases, the addition of this Automatic Index Base has increased milling production enough to eliminate need for the purchase of additional machinery. It may be the answer to your milling production requirements. Call in a Sundstrand engineer. There is no obligation for this service.

Accurate Spacing, Powerful Clamping Insures Accuracy



Sundstrand Automatic Index Base

This automatic index base is designed so there is no strain against the index plunger during the cut. The base is locked by powerful clamping so that accuracy of index is not affected by heavy cuts.

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This 8 page booklet contains production figures and specifications. Send for your copy today. Ask for bulletin

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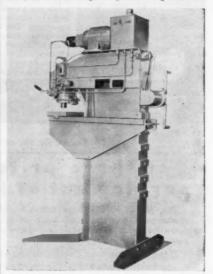


SUNDSTRAND MACHINE TOOL CO. 2535 Eleventh Street, Rockford, Ill., U.S.A.

Hydraulic gap presses have adjustable bed

Wilson adjustable bed, hydraulic gap presses in 15 and 25 ton, hand-air-oil and motor driven models, have an adjustable bed that is easily raised or lowered to handle large or small pressing jobs. Bed plates are self locking in any position by means of a tilt lock design that eliminates pins, bolts of blocks.

Hand-air-oil models have an air-oil internal spring return type cylinder. Fifty pounds shop air pressure produces



a ram travel of eight inches per second down to the work. One stroke of the hand pump handle builds up tons of pressure on the work. All controls are operated with one hand.

Motor operated models provide adjustable hydraulic pressure on both downward and return stroke of ram. Control and pumping unit are located on top of press, thereby giving operator clear access to work from all sides. K. R. Wilson, Inc., Dept. RH, 215 Mill St., Arcade, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 31



Rehnberg-Jacobson ALL-MECHANICAL Drill, Tap, and Index Units are specially designed for YOU to use for making up YOUR OWN special-purpose machines - or for adding to or modifying some of the special-purpose (or standard) machines you now have. They are accurate, efficient, economical - and available in enough models and sizes to suit most every need. WRITE TODAY for Data Sheets giving complete engineering information.

TAP UNITS, for example, are made in four capacities from 5/16 - 18 and 1-1/4" stroke to 1-1/2 - 6 and 4-1/2" stroke. They are self-contained, with lead



REHNBERG-JACOBSON MFG. COMPANY

2135 KISHWAUKEE ST., ROCKFORD, ILLINOIS

Encircle No. 445 on Card, Opposite Page 65



Empire Live Centers

Quality engineered for use on lathes, grinders, and milling machines . . . Empire Live Centers are versatile, accurate, heavy duty. Tapered seats give consistent precision alignment . . . assure accuracy of .0001. Positive seal eliminates dirt, grit, cutting oils. Combination bearings absorb both radial and thrust loads.



Manufactured in all tapers: Morse, Brown & Sharpe, Jarno, straight shank, and special shanks to order. Special points to order.

Empire Toolmaker's Set available in handrubbed American Walnut case.

See your local distributor or write direct. Literature on request.

ROYAL PRODUCTS, 84 Union Street, Mineola, L. I., N. Y. Ploneer 6-4245

Encircle No. 446 on Card, Opposite Page 65

October, 1955

309

Dust collector uses custom-built bin

The Dustkop Model 2030 dust collector, for installations where collected dust runs to unusually high volume or where factory floor space is at a premium, utilizes a storage bin constructed by the customer to meet his particular storage and dust removal requirements, and placed outside the building or inside where space allows. The collector itself may then be located



overhead in ceiling girders or on the roof, and connected to the bin by a pipe extended downward at an angle of no less than 45°. Aget Mfg. Co., Dept. JS, Adrian, Mich.

Use ACTION Card, opposite page 64. Encircle No. 32

Gearless drill heads

A new series of in-line drill heads is for drilling, tapping or reaming holes in a straight line in an elongated pattern. Simultaneous multiple hole drill-



Do more . . . and do it better with Errington Fixed Center Drilling Heads. They drill any number of varied size holes on different elevations. The head has grooved thrust ball bearings at all thrust points and hardened bronze radial bearings. Heat treated spindles and gears, of one piece turned from solid bar stock. It is geared approximately 2:1. All enclosed in a sand-cast aluminum case and cover, with alemite pressure lubrication.

Send for Complete Catalog

ERRINGTON Mechanical Laboratory, Inc.

Established 1891

Main Office and Plant STATEN ISLAND 4. NEW YORK

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MACHINE and TOOL BLUE BOOK

ONCENTRIC the original, CENTERS patented spring loaded live center

Smaller turning radius gives much higher RPM rate than ordinary live centers.

Spring loaded spindle gives automatic tail stock adjustment.

GREATER LOAD CAPACITY LONGER LIFE JAM PROOF

> Write today for complete information

FASTER SPEEDS **AUTOMATIC THRUST ADJUSTMENT**

> LESS OVERHANG MEANS MORE RIGIDITY. . MORE WORKING RANGE



Pat No. 2,520,473

CONCENTRIC TOOL CORP 2486 Huntington Drive, San Marino, Calif

Encircle No. 448 on Card, Opposite Page 65

BIG JUMP FORWARD

in Boring and Facing!

Six Sizes Available



Our Model "D"

All Models Have POWER FEED for Facing

that Won't Face is Not Complete

RE-DESIGNED Many New Features

Write Today for Complete Details

CHANDLER TOOL COMPANY, MUNCIE, INDIANA

FACING TOOL HEADS COMBINED BORING

Encircle No. 449 on Card, Opposite Page 65

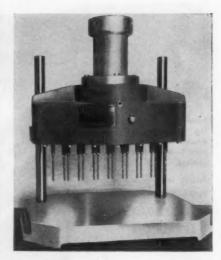
UNIVERSAL DRILL BUSHINGS OUTLAST THEM ALL!



Superfinish bores reduce wear.
Blended radius helps prevent tool hang-up and breakage. 100% concentricity and hardness tests insure accuracy and uniform high quality.
Write for complete information.

UNIVERSAL ENGINEERING CO.

FRANKENMUTH 10, MICHIGAN 180-B



ing in a straight line reduces drilling time and fixturing costs, in addition to reducing the number of machines required for some jobs.

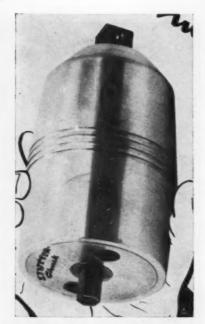
Capacities are holes arranged in a straight line 13" long, 15" long, and 26" long. Drill sizes are \(\frac{4}{0}'' \) to \(\frac{4}{0}''' \). Zagar Tool, Inc., Dept. RH, 24000 Lakeland Blvd., Cleveland 23, O.

Use ACTION Card, opposite page 64. Encircle No. 33

Attachment converts drill to impact wrench

The "Stutter Chuck" is a device which instantly converts an electric drill to an impact wrench. Instrument chucks up into portable electric drill, or drill press, serving as a fastening tool. It tightens bolts and nuts, wood screws, lag screws, etc., via rotary impact.

Cylindrical in shape, the attachment weighs but two pounds, is 3\%" long by 2 5/16" dia. The four models have socket drive sizes ranging from \%" sq. to \%" sq.; with input shaft size from 5/16" to \%". One model will deliver four blows per revolution; the balance will give two blows per revolution. De-



pendent upon type of portable electric drill, range of rpm's is from 750 to 2400. Hewitt & Co., Dept. B, 1827 S. Hope St., Los Angeles 15, Calif.

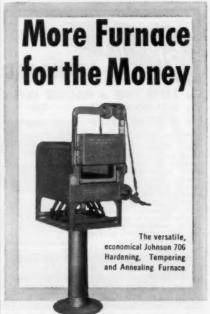
Use ACTION Card, opposite page 64. Encircle No. 34

Chip absorbing setup blocks protect machine table surfaces

Jergens Tool Specialty Co., 712 E. 163rd St., Cleveland, 0., has announced the development of new aluminum alloy multi-step setup blocks which are claimed to save machine setup time and protect expensive machine tables from scratches and nicks.

Softer than the machine table, these new blocks actually absorb metal chips, and even if dropped will not injure the machine table, it is reported. Blocks withstand great weight under clamping pressures, are designed for use on jig bores, boring mills, drill presses, milling machines, planers, etc.

They hold work from zero to 3" and



GET CLEAN, UNIFORM HEAT AT LOW COST. With the full range of all temperatures needed — from 300° to 1850° F. — the Johnson 706 Furnace is easily regulated, economical. The six direct jet Bunsen burners have separate valves and pilot lights. Ratchet-operated door easily adjusted — opens upward to permit insertion or removal of parts. 7" x 13" x 16½" firebox, lined with high temperature refractory.

No. 706 Pedestal
(Illustrated) . . . \$300.00
No. 706 Bench . . . \$275.00
No. 654 with 5" x 7%" x 13%" firebox:
Pedestal \$163.00
Bench \$138.00
All Prices F.O.B. Factory. Immediate Delivery;

JOHNSON GAS APPLIANCE CO. 570 E. AVE. N.W. CEDAR RAPIDS, IOWA

Order Now!

JOHNSON FURNACES FOR INDUSTRY

Encircle No. 451 on Card, Opposite Page 65



- . TAPER PINS . MACHINE KEYS
- WOODRUFF KEYS
- . MACHINE RACKS

Yes, "Specify Standard" and you are certain of quality products to meet your production requirements. Your needs for the above items can best be served by Standard whose 2 plants (Beaver Falls, Pa. and Hammond, Indiama) are equipped to serve you. Write today for your free copy of Standard's catalog with specifications.



STANDARD STEEL SPECIALTY CO. BEAVER FALLS . PENNSYLVANIA Plants: Beaver Falls, Pa.; Hammond, Ind.

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A 4 position automatic indexing tool—RIGID-ACCURATE-COMPACT. Built to most exacting requirements. Parts are of alloy or tool steel, heat treated and ground to closest working tolerances. Available for 12", 14" and 16" machines. Write for complete details and illustrated folder.

Westwood Engineering Company 2234 Purdue Ave. West Los Angeles Encircle No. 453 on Card, Opposite Page 65



can be mounted on 3" high risers and thus pyramided to any desired height. Block is locked to the riser by means of a male boss and female cavity.

Use ACTION Card, opposite page 64. Encircle No. 35

Additions to end mill line

Two new, 3 fluted, single-end end mills, the long style offering flute lengths from 14" to 4" and the short style from %" to 2", have been announced by Arrow Tool & Reamer Co., Dept. B, 418 Livernois Ave., Detroit 9, Mich. Arrow's 3 flute, double-end end mill offers flute lengths from %" to 134".

Use ACTION Card, appesite page 64. Encircle No. 36

MACHINE and TOOL BLUE BOOK



- METAL LATHERS' BENDER

Although this bender was designed primarily for the lathing trade, it is used by many different types of metal-working concerns who need a well-made and easy to operate hand powered bender of the following capacity:

18" round or square iron 2"x1/2" channel iron 21/4"x18" flat iron cold

Send for Catalog Sheets on Our Complete Line

T. H. LEWTHWAITE MACHINE CO. 312 East 47th St. New York 17, N.Y.

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Encircle No. 455 on Card, Opposite Page 65

All II.S. Steel & Carbide Tools salvaged and resharpened (Write for cotalogue)

ESSEX ROTARY FILE & TOOL CORP

Makers of Fine Tools Since 1968

NEW YORK 17, N. Y

CARNES SUMP CLEANERS

ARE DESIGNED FOR THE SMALLEST MACHINE SHOPS

Pictured is the DLN Carnes sump cleaner. It consists of a pumping unit mounted on a drum lid which fits standard 55 gallon open end drums. Sludge, chips and coolant are drawn from the sump into the drum for easy disposal. Models for bigger cleaning jobs available, too. Capacities up to 200 gallons.

Write for literature and details to:



COOLANT EQUIPMENT CORPORATION

WISCONSIN

Encircle No. 456 on Card, Opposite Page 65

MUBEA SHEARS-PUNCHES

Hand- and Power - Operated for every purpose



Write for Literature

ALWIN FR. WILKENS, INC. 15 Moore Street, New York 4, New York

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October, 1955

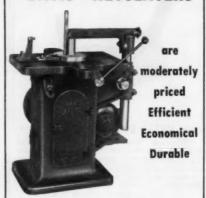
295 MADISON AVE.



Encircle No. 458 on Card, Opposite Page 65







Built in 3 sizes for cutting keyways 1/16" to 1" width, Circular upon request.

DAVIS KEYSEATER CO.

4071/2 Exchange St.

Rochester 8, N. Y.

Encircle No. 460 on Card, Opposite Page 65



Tamms Industries, Inc. 228 N. LaSalle St. Chicago 1, III. Encircle No. 459 on Card, Opposite Page 65 316



Encircle No. 461 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

SET UP COMPOUND ANGLES INSTANTLY!

Now save valuable time on intricate, angular set-ups with the fully universal MASTER MULTI-SWIVEL VISE. Three swivels instantly set any compound angle. Used worldwide. Interchangeable platens optional.

Write for circular.

DONOVAN MFG. CO.

80 Batterymarch St. Boston 10, Mass.



Encircle No. 462 on Card, Opposite Page 65

Pneumatic die cushion can double airline pressure

The Model HCC-24-6 die cushion will develop 180 tons on 100 lb. shop airline pressure. It is provided with a special booster pump to double pressure.

Cylinders and pistons are of all-steel

welded construction with bronze bearing surface on the pistons. Centralized lubrication system enables all lubricating to be performed through one source.

Each die cushion installation is furnished with regulating valve and pressure gage to assure constant ring holding pressure to the desired working requirements of the die cushion installation. Dayton Rogers Mfg. Co., Dept. B, Minneapolis 7, Minn.

Use ACTION Card, opposite page 64. Encircle No. 37

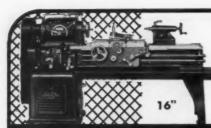


Push buttons control drills

Push buttons replace conventional levers and handwheels in the Morris Hydra Power 13" and 15" column radial drills. Merely pushing a button will raise or lower the arm, traverse the head left or right, clamp or unclamp the arm, head or column, and shift the gears. Drills are hydraulically actuated. All push buttons are located in a single panel within easy reach.

It is possible to select the spindle





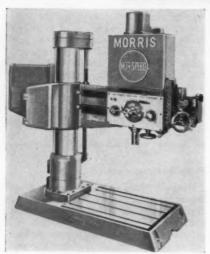
CARROLL AND JAMIESON LATHES

• This 16" lathe is equipped with 12 speed geared head, motor drive, and Timken mounted spindle. It's modern in design - with liberal dimensions.

Write today for descriptive bulletin.

HE CARROLL & JAMIESON MACHINE TOOL CO. 。

Encircle No. 464 on Card, Opposite Page 65



speed and feed for the next operation while the current operation is being performed. The operator dials the new

speed and feed. When the current operation is complete, he pushes a button and the new speed-feed combination is automatically selected.

A large diameter quill is mounted on precision bearings as close to the work as possible. The bearings remain at the same distance from the work point as the tool is fed. The spindle is equipped with an adjustable counterbalance to offset excessive weight of special tools and adaptors. Morris Machine Tool Co., 933-24 Harriet St., Cincinnati 3, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 38

Tool holders clamped directly to riser plates

A simplified quick change tooling method for removing stock from rough forgings eliminates regular tool blocks by bolting Kennametal clamped tool holders directly to riser plates on machine carriages.

Claims made are: considerable chip clearance; lower cost; closeness of tools,





no need for in-between support; quick changeover from one size workpiece or operation to another on the same machine; clamped tool inserts readily accessible. Kennametal, Inc., Dept. B, Latrobe, Pa.

Use ACTION Card, opposite page 64, Encircle No. 39

Threading die holder for lathe

Using ordinary 1½" od round threading dies, this new holder will thread up

New KNURLMASTER
Hand Knurler
\$13.50

No distortion—
even on 1/8" stock!
MODEL "C"

For small production runs on 1/8" to 1" stock. Exclusive screw design gives perfect knurl pattern. Furnished with 3 hardened knurls of standard 1/2" dia. Forged steel frame is self-centering. Write for illustrated folder.

Dealer Inquiries Invited

ROCKWIN MANUFACTURING CO.

43-45 Rose St. New York 38, N. Y.

Encircle No. 466 on Card, Opposite Page 65

to ½" diameter rod and up to 6" long. The holder is fitted with a No. 2 or 3 Morse taper shank and held in the lathe tail stock, while the work to be threaded is held in the lathe chuck. The lathe, equipped with a reversing switch, can produce threading at a rate equal to a regular rod threading machine.

The holder automatically travels according to the feed required for the thread size. Distance is determined by graduation marks. Stone Welding & Machine Works, Honeoye, N.Y.

Use ACTION Card, epposite page 64. Encircle No. 48



on the LINLEY is fast, low in cost and noiseless

Save time and money by putting your riveting on the LINLEY RIVETER. Send us samples of your work and we'll gladly and without obligation give you estimates on the time and cost of handling your work the LINLEY WAY.

Available in sizes and types for Iron and cold rolled, steel rivets up to %"; larger rivets of softer materials can also be handled.

Send for Bulletin R Today

LINLEY BROTHERS CO. 673 State St. Ext. Bridgeport 1, Conn.

Encircle No. 467 on Card, Opposite Page 65

Dead weight pressure gage tester

The Amthor Testing Instrument Co., Dept. B, 45-53 Van Sinderen Ave., Brooklyn, N.Y. has announced improved models of its dead weight pressure gage tester.



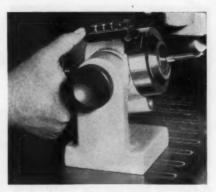
Claimed accurate within 1/10 of 1% of the indicated reading. Complete unit with accessories is portable and contained in a metal case. Three models are available: up to 3000 psi; from 4000 to 6000 psi; up to 10,000 psi.

Use ACTION Card, opposite page 64. Englecie No. 42

Portable tap sharpener

According to the manufacturer, the Rocket tap sharpener makes it possible to resharpen either right- or left-hand taps of two, three, or four flutes in about three minutes. It can be used on any grinder with a magnetic chuck.

Sharpener has one \(\frac{\pi}{2}'' \) collet, and will accommodate any standard 5-C collet of \(\frac{\pi}{2}'' \) to 1" capacity. The first liner sleeve is of center to cut radial



clearance on tap. The second liner sleeve is on dead center for indexing purposes. Sleeves are of carburized and hardened steel, base is of cast iron, and there is a holder for a steady-rest finger. Sharpener measures 6"x6"x7". Rockford Die & Tool Works, Inc., Dept. RB, 1816 Seventeenth Ave., Rockford, Ill.

Use ACTION Card, opposite page 64. Encircle No. 43

Tool extension adapter

Precision honed, the Brookfield adapter claims positive wrap-around shank circumference without deforming or scoring the tool held.

Unit is machined from alloy steel, hardened and stress relieved. It is precision made, the base and shank being parallel within .0001 and concentric within .0005. There are no loose parts. Each adapter is machined as a single unit and clamps with a standard socket head cap screw. Brookfield, Inc., Stoughton 16, Mass.

Use ACTION Card, esposite page 64. Encircle No. 44



High speed tapping tool

The Jarvis Super Torqomatic is a production tool that is claimed to deliver unusually high tapping speeds. Helical gears have a 1 to 1 reverse ratio. These gears equalize the forward and reverse speed of the tap for a smooth



retraction that will not endanger either finish or tool.

Toggle-type clutch affords an ultrasensitive forward and reverse action giving positive control over the quality and accuracy of the tap. Jarvis Corp., Department BB-6, Middletown, Conn.

Use ACTION Card, opposite page 64, Encircle No. 45

Electric drill attachment

The Supreme Versamatic electric drill attachment boosts power, reduces speed and changes a quarter-inch drill into a high power tool with a hand-type clutch for forward and reverse.

A 7 to 1 speed reduction steps up



power in proportion. Drive is provided for big diameter drilling, tapping. The unit transforms a ¼" drill into a power wrench for running nuts on or off or into a power screwdriver for handling even the largest screws. Scott-Mitchell House, Inc., Dept. MJG, 611 Broadway, New York 12. N.Y.

Use ACTION Card, opposite page 64, Encircle No. 46

Cam vises for use on production equipment

A line of cam vises specifically built for use on production equipment features vise bodies machined from specially compounded alloy castings that are strong and shock resistant. Vises hold firmly, have hardened and ground jaws and hardened steel joint and adjusting screw.

Four models are stocked: 4" jaw width with 5/32" or %" cam throw and 5" jaw width with 5/32" or %" cam throw. Jaw depth is 1½" with keyways %" wide and %" deep. Special jaws can be furnished. Modern Tools Div., Nelco Tool Co., Inc., Dept. B, Berlin, Conn.

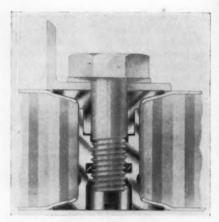
Use ACTION Card, opposite page 64, Encircle No. 47



Self-locking feature added to bolt spacer

A new Fasco self-locking threaded type of bolt spacer for structure fastening is designed for applications where lightweight and vibration resistance are important requirements. Spacer is a two piece unit consisting of a plug and a tapped sleeve containing a self-locking nylon insert. The tapped sleeve receives the attaching bolt and eliminates the use of a nut. The spacer lock is effected by a nylon insert located in the tapped sleeve section of the spacer. Self-locking feature prevents the loss of the bolt due to vibration.

Spacers provide a means of attaching conduits, cables, instruments, and other equipment to sandwich type structure without danger of crushing panels. They are useful on fragile structures where fastening takeup must be limited to a specified grip length. Available in No. 10 screw size for panel thicknesses from



½" to 1¼", Nos. 8 and ¼-28 screw sizes will soon be available. Material is 24 ST-4 aluminum alloy, anodized. The Delron Co., Inc., Fasco Div., Dept. MB, 5224 Southern Ave., South Gate, Calif.
Use ACTION Card. opposite page 64. Encircle No. 55

ECONOMY



SPELLS SAVINGS

If your requirements call for DU-PLICATION of standard items, it will pay you to specify — "ECONOMY" ... Delivery is always dependably prompt because all items are continually in stock.

★ "TRU-LOC" Adjustable
Adapter Sleeves and Nuts —

★ A. S. A. DRILL JIG BUSHINGS

★ A. G. D. PLUG & RING GAGES

Get our prices on salvaging your wornout plug and ring gages.

> Descriptive Bulletin & Price List Upon Request —

ECONOMY TOOL & MACHINE CO.

1829 S. 68th St. • Milwaukee 14, Wis.

Compression and tension tap holders

The JT lock and eject collet-type of compression and tension tap holders compensate for variation between the feed of the spindle and the lead of the tap, on multiple spindle machines which take adjustable adapter shank tools.

Holders eliminate the need for lead screws on many tapping operations. Taps of various pitches can be used without making costly feed changes on multiple spindle tapping operations. The compression tap holder should be used when the spindle feed is greater than the tap lead. The tension tap holder should be used when spindle feed is

less than the tap lead. The sensitive compression or tension spring permits the tap to follow its own lead without damaging the thread. Scully Jones & Co., 1901 S. Rockwell, Chicago 8, Ill.

Use ACTION Card, opposite page 64. Encircle No. 56

J. I. C. Valve heads

Hannifin Corp., 530 South Wolf Rd., Des Plaines, Ill., has announced new solenoid heads for its P-M 3-way and 4-way Pilot-Master valves. Developed to meet the new J.I.C. electrical recommendation that air cylinder control valves be developed that would be electrically inoperative if a maintenance man should remove a solenoid cover and fail to replace it.

Solenoid covers are die cast of zinc alloy and so gasketed that the valve becomes splashproof and dust tight. Each cover is chained to the valve so it cannot be mislaid. It is held in place by four "captive" screws which do not

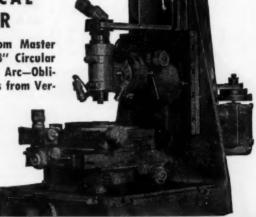


JIG BORER

6"x6" Linear Capacity from Master Glass Scales in .00005"—8" Circular Capacity in 10 Seconds of Arc—Oblique Holes up to 15 Degrees from Vertical.

Built-in Microscope within Spindle converts Machine into co-ordinate Measuring Microscope.

> Request Catalog 8089



Geo. SCHERR OPTICAL TOOLS, Inc.

Encircle No. 469 on Card, Opposite Page 65



fall out of their holes in the cover when loosened. At the end of each cover is a manual operating button to provide manual operation of the valve without

removing the cover. This operating button is sealed with an 0 ring so as not to vitiate the splashproof, dust tight feature.

Use ACTION Card, opposite page 64, Encircle No. 57

Dial snap gages give direct reading

A new line of dial snap gages has been announced by Lincoln Park Industries, Inc., Dept, JS, 1719 Ferris Ave., Lincoln Park 25, Mich.

They give a direct reading from the measuring anvil to the indicator. There are no bearings, levers, shafts or cams to wear or get out of adjustment. As a result, accuracy is constantly maintained, the manufacturer claims.

Parallel anvils are tipped with solid cemented-carbide. Precision adjustments of the upper anvil by means of a fine pitch ground thread attachment can be made within a 4" range. The



in hack saw blades

Here are the sharpest, cleanest cutting machine hack saw blades ever made! They are completely newmade by new methods, newly designed equipment. They meet your toughest production requirements for long life and economy.

Ask for the Disston Super-Safe Hack Saw Blades! Get your Disston Distributor to make a comparison test in your shop—on your machines. Let practical results-not claims-convince you. Ask him about Disston's complete line of Hand Hack Saw Blades and Frames-and get overall economy.

Send for this FREE production help

Free production man's pocket guide. Tells proper teeth, feed, stroke for best metal cutting results. Write:

Henry Disston & Sons, Inc., 949 Tacony, Philadelphia 35, Pa., U.S.A. Other factories and branches: Toronto, Seattle, Chicago.

Encircle No. 470 on Card, Opposite Page 65



entire construction is shockproof. The indicators, which may be of any A. G.

D. size, are encased in a housing to protect them from damage. Ten standard models are supplied in sizes up to 2.500 inches.

Use ACTION Card, opposite page 64. Encircle No. 58

Three-jaw scroll chuck has single-point adjustment

The Skinner Chuck Co., Edgewood Ave., Dept. B, New Britain, Conn., has introduced the Cent-R-Quik 3-jaw universal scroll chuck that permits centering of the workpiece to less than .0005 total indicator reading.

It incorporates a new single-point fast-adjustment feature that reportedly will not shift even under the heaviest cuts. Any number of duplicate parts can be chucked without making readjustments. Since all adjusting is done internally, there is no movement of the chuck body in relation to the machine spindle.

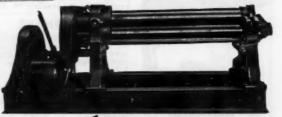
The jaw-adjusting feature and the

Beloit

BENDING ROLLS

Sheets and plates are quickly formed into cylindrical shapes with this efficient, hard working Beloit Bending Roll. Built for years of trouble-free service. Easy to operate. Rolls are of slip type. Hinged housings permit speedy removal of completed cylinders. Reversing lever places machine in readiness for the next job. Do forming quicker easier and at lower cost with Beloit equipment.

Beloit equipment will cost you less and serve you better.



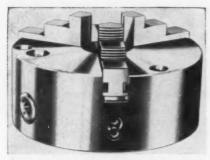
Picture shows a member of the famous Beleit line which also includes Punches, Shears Red Cutters, Notthers, Bending and Straightening Rells.

Write for complete details

WHITTEMORE CO.

100 Blackhawk Blvd. Beloit, Wis.

Encircle No. 471 on Card, Opposite Page 65



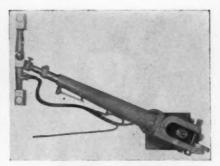
wide work-holding range of the chuck jaws eliminate the need for collets. The chuck is operated by a single pinion.

Use ACTION Card. opposite page 64, Emeirole No. 59

Adustable press control arm

An adjustable press control arm provides a flexible method of positioning the "run" and "stop" buttons on presses.

The control buttons are mounted on



a bar attached to arm. Telescoping shafts permit any desired height adjustment. Although the unit is permanently mounted on the press, the arm can be swung completely clear of the working area when changing dies, and can be instantly relocated when production is resumed. Danly Machine Specialties, Inc., Dept. RB, 4358 W. Roosevelt Rd., Chicago 50, Ill.

Save Time...Labor...Materials with



Inside SLOTTER

Makes cuts up to 8" inside edge of sheet. Sharp, clean burr-free cuts always assured. Cap. 16 ga. High strength aluminum alloy body; H.C.H.C. blades.

Throatless SHEAR

Make any cut—straight, irregular, curved. Exclusive design permits turning work any direction while cutting. 4 models—cap. to 3/16".

Slitting SHEAR

New "SS" Series—easier cutting with compounded linkage. 3 models—cap. to 3/16"; trimming capacity to 5/16" mild.

See your Beverly Distributor. Write for FREE illustrated Bulletin.

BEVERLY metal cutting SHEARS



Beverly SHEAR MFG. CO.

3005 W. IIIth STREET . CHICAGO 43, ILLINOIS

Encircle No. 472 on Card, Opposite Page 65

Trigger-release toggle clamps

Models 482, 484 and 486 "trigger-release" portable plier-type toggle clamps enable the operator to hold the workpiece with one hand and clamp and release with the other. A touch of the trigger throws the jaws of these clamps open, ready for the next clamping action.

These clamps are claimed to develop greater holding pressures, withstand

Trugger Balanas

rugged use, enable an operator to reach hard-to-get-at places.

Hardened bushings are inserted from one side through the entire width of the forged components. From the other side, a rivet is inserted entirely inside of and through and beyond the length of the hardened bushing. Then the end of the rivet is spun over to lock the assembly into its proper place. Detroit Stamping Co., Dept. B, 340 Midland Ave., Detroit 3, Mich.

Use ACTION Card, epposite page 64, Encircle No. 61

Open web joist and stirrup bender

The Wallace No. 35 hydraulic bender is used for bending the web in steel joists used to support floors and roofs of buildings, and stirrups used for reinforcement in concrete columns.

Operated by two hydraulic foot valves, permitting the operator the use of his hands to position the web bars, the machine drives under full power



VERTICAL

At last, a top quality industrial sander that provides all the most wanted \$99.95 features - yet sells for so little.

Illustrated Literature on Request
A few desirable distributor
territories still available.

WALLS SALES CORPORATION
333 Nassau Avenue Brooklyn 22, N. Y.

Encircle No. 473 on Card, Opposite Page 65 October, 1955



Multiple Spindle Magazine Feed Power Screw Driving Machines

Latest type equipment for driving screws faster in products requiring two or more screws. These machines operate easily and require very little attention or adjustment once they are put in production.

Part Feeder

Model C Automatic Part Feeders provide an efficient means of feeding parts to Automatic Machinery. They are fast feeding, have large storage capacity and are easy to load.

Pat. applied for.



COOK & CHICK CO 2415 WEST 24th ST. CHICAGO 8, ILLINOIS

Encircle No. 474 on Card, Opposite Page 65



both clockwise and counterclockwise.

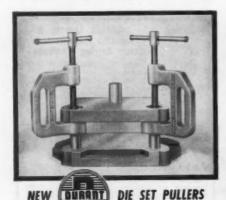
A 5 hp motor drives the hydraulic pump. Head rotates at 13 to 15 rpm. It will make a bend to one-half the bar diameter. Wallace Supplies Mfg. Co., Dept. MTB, 1300 Diversey Pkwy., Chicago, Ill.

Use ACTION Card, opposite page 64, Encircle No. 62

Vise for holding duplicate pieces

The Model 4CL Camlock vise is claimed to speed up production in drilling, milling or general machine shop use when a quantity of duplicate parts must be held. The operator can lock and unlock the vise with one hand while inserting and removing pieces with the other. A short horizontal movement





Easily removes punch holder from die shoe by a stroight upward puil. They fit most sizes of die sets — no wearing parts. Easy to use, easy to store. Handy handles and sliding adjustment bar insure smooth efficient operation.

118.00 PER PAIR

Write for bulletin on die set pullers and complete Durant line.

DURANT TOOL SUPPLY CO.

136 SOUTH WATER STREET . PROVIDENCE 3, R. I.

Encircle No. 476 on Card, Opposite Page 65



Encircle No. 475 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

of the locking lever clamps or releases the part.

Conversion into jig or fixture is possible with attachment of special jaws, bushing plates, etc. Vise has 4" wide jaws infinitely adjustable to 4\%" opening, providing space to accommodate a wide range of work and for attachment of jig and fixture components. Maximum travel after setting is 5/16". Controlled pressure permits holding with a light touch for fragile parts, to a tight 2000 pound squeeze for heavy duty work.

Wide clearance between jaw guides permits drilling through work without interference. Hardened and ground parallel bars maintain jaw alignment. Heinrich Tools, Inc., Dept. RB, 1536 Clark St., Racine, Wis.

Use ACTION Card, opposite page 64, Encircle No. 63

Free mounted wheels for job testing

Chicago Wheel and Mfg. Co., Dept. RB, 1101 W. Monroe St., Chicago, is making a free offer of two mounted wheels for actual jog testing. Size of these straight wheels is %" x %" on %" mandrel.

Use ACTION Card, enposite page 64, Encircle Ne. 64





ACCURACY of costly machine tools may be ruined using ordinary bolts of soft steel. It is low cost insurance to use Boyar-Schultz precision made T-Slot bolts. Made from heat treated, Alloy steel, heads machined at right angle to shank, to present a broad, flat surface to upper surface of T-slots. Class 3 threads do not strip or distort. For best results use Special Nuts and Washers.

BOYAR-SCHULTZ CORPORATION 2008 S. 25th Ave., Dept. F-B, Broadview, III.

Encircle No. 478 on Card, Opposite Page 65



Encircle No. 477 on Card, Opposite Page 65 October, 1955

P. O. BOX 750 . COLUMBUS, OHIO

Motor and gear train unit

A motorized gear train unit, for applications demanding high power and low speeds, but where dry cells or other batteries are the most expedient or the only available source of power, is motivated by the Wilson Hi-Drive motor, available in two voltage ranges, 11/2 to 3 and 3 to 6 volts, with a third range of 6 to 12 volts now in process of development. It has an Alnico permanent



SPEED ACCURACY. **ECONOMY** spindle capacity or over.

for

Automatic adjustment speeds up production in multiple operations with push-out type HALL COLLET CHUCKS. Full

> Tremendous grip over or under stock size to .007-without adjustments. All grip ... no slip. No bearings...no heat or lost power. Instant release without stop ping lathe.

SATISFACTION GUARANTEEDS

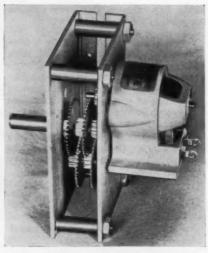
Made in Two Sizes to Fit Your Requirements:

Model A...1" (max. capacity 1-1/16") Model B...2" (max. capacity 2-1/16")

nd, square or hexagon collets, plain or serrated No. 3 Collet Pads New Available

Write today for illustrated catalog and price list - Dept. A . 12 HALL MANUFACTURING COMPANY SEZ TULAROSA DRIVE, LOS ANGELES ZE. CALIFORNIA

Encircle No. 479 on Card, Opposite Page 65



field magnet and a wound 3-pole armature. Brushes are bronze or carbon. Motor is reversible. The entire motor and reduction gear unit is only 3\%"x 3"x21/8" over the drive shaft.

Motor speeds at no load, depending on type of brushes and applied voltage, will vary from 2000 to 10,000 rpm. Speed can be controlled by a small rheostat. Since the ratio of motor speed to drive shaft speed is 662 to 1, drive shaft speed can be varied from 3 to 15 rpm with ample power. Wilson's of Cleveland, 425 Lakeside Ave., N.W., Cleveland 13,

Use ACTION Card, opposite page 64. Ensirele No. 65



ROTARY BUSHINGS FOR DRILLING, CORE DRILLING ROUGH AND FINISHED BORING

The inner race of the GATCO bushing rotates with the tool, piloting and tool accurately below or above the work-or both.

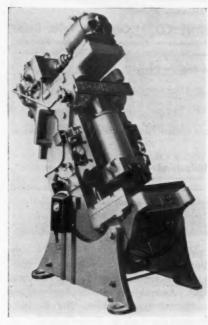
Eliminates expensive tool construction-Reduces tool wear-Prevents seizure and pilot breakage Especially adapted where precision is required. Write for full information and prices

Encircle No. 480 on Card, Opposite Page 65

Die tryout press

The Bliss hydraulic press for die tryout and pilot production runs is claimed to combine the best features of hydraulic action and gap frame construction.

Precise control over inching, permitting close observation of die action. Full

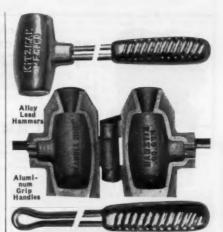


tonnage is available at any point in the stroke. Longer stroke compensates for die space and press setup adjustments, which facilitates die tryouts and pilot runs. Capacities ranging from 50 to 250 tons. E. W. Bliss Co., Canton, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 70

Industrial cleaning equipment

The Carnes 2OT-120 is a machine which removes all sludge, chips and oil from machine tool sumps, filters out the waste material, and delivers fresh oil to the machine tool. It has a capacity of 75 gallons for fresh oil



Hinged Hammer Moulds

1, $2\frac{1}{2}$ and 5 lb. sizes—order your alloy lead hammer requirements from your machine tool supply house

or direct from:

KITZMAN MFG. CO.

15061 Hartwell Ave. Detroit 27, Mich. Encircle No. 481 on Card, Opposite Page 65

D & M PUNCH PRESS GUARD



No Springs

No Cables

\$30.00 TO \$44.00 F.O.B. BUFFALO, N. Y.

Low Maintenance

 This punch press guard meets the most exacting standards of safety engineers and safety laws.
 Permits operator to feed the press without hindrance. Write for complete information.

Immediate Delivery

D & M GUARD CO.
895 Military Rd. Buffalo 17, N.Y.

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for chamfering bar stock PRIOR TO SCREW MACHINE OPERATIONS THE KENT BAR POINTER

Entirely self-contained. Manual or pneumatic operated feed and gripping mechanism. Capacity %" minimum diameter up to 24" hexagon. Stationary and portable.

Literature available.

The KENT MACHINE CO., Cuyahoga Falls, Ohio Drillers • Threaders • Slotters • Countersinkers • Bar Pointers

Encircle No. 483 on Card, Opposite Page 65



and 75 gallons for the waste oil, sludge and chips. A hand operated pump dispenses the fresh oil. The 20T-120 is also available in 200 gallon total capacities. Coolant Equipment Corp., Dept. RB, Verona, Wis.

Use ACTION Card, opposite page 64, Encircle No. 80

Industrial light improved

Numerous improvements are featured in the newly announced line of Fostoria Localites for machine tools, assembly and inspection operations.

Universal arm joints with large frictional triple disc bearing surface provide 135° bend. Collar disc joints rotate 180°. Assemblies include heavy duty industrial type sockets. The Fostoria Pressed Steel Corp., Fostoria, Ohio.

Use ACTION Card, opposite page 64, Encircle No. 71

COOPER WEYMOUTH OPEN THROAT AIR OPERATED SLIDE FEED

For Power Press Operation

Operates on standard shop air lines. Easy to set up and adjust, holds to extreme accuracy. Made in five sizes. Feeds lengths to 36", up to 18" wide on mechanical and hydraulic presses.

COOPER WEYMOUTH, INC.



277 Noble Ave.

Bridgeport 8, Conn.



Plunket Quick Action Vise for DRILL PRESS or MILLING MACHINE

Designed for production work, using an eccentric motion to apply pressure to graws. Eccentric motion moves jaws 5/16".

Size No. 7 Net Price 6" Jaws, 1½" deep, opens 4"591.48
Pressure between jaws, with handle furnished, 2200 lbs, Net weight 36 lbs.

Our complete line includes Vises for Drill Presses, Milling Machines, Shapers, Grinders

WRITE FOR CATALOG

J. E. Plunket Machine Co. 3238-32 Archer Ave. Chicago 8, III.

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MOTOR MICA

TRADE MARK REG. U. S. PAT. OFF.

ANTI-FRICTION COMPOUND
In White Powdered Form
COOLS HOT BEARINGS
SAVES WEAR ON MOVING PARTS

Write For Free Sample

SCIENTIFIC LUBRICANTS CO. 3469 N. Clark St. · Chicago 13, III.

Encircle No. 486 on Card, Opposite Page 65



Encircle No. 489 on Card, Opposite Page 65



No. I cuts up to No. II gauge strip or sheet. No. 2 cuts up to $\frac{1}{4}$ steel plate.

BREMIL MFG. CO. 1020 Holland Street, Erie, Penna.

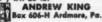
Encircle No. 487 on Card, Opposite Page 65



Encircle No. 490 on Card, Opposite Page 65

MAKE HARDNESS TESTS With The KING PORTABLE BRINELL

Puts a load of 3000 kg. on a 10 mm ball. Can be used in any position — even upside down. Removoble test head for testing very large parts. Guaranteed to make accurate Brinell tests. Throat 4", gap 10", wt. 26 lb.





Encircle

JIG BORING

and

Large Precision Machining Done to your specifications

WE HAVE 13 JIG BORERS

KIDDE PRECISION TOOL CORP.
25 LOCUST AVE. ROSELAND, N.J.

Encircle No. 488 on Card, Opposite Page 65 October, 1955

Encircle No. 491 on Card, Opposite Page 65

333

"This Seems Worth Looking Into" GEM VISES
"Standard of Efficiency"

GEM MACHINE VISES



Complete range of sizes for all Machines. Plain. Swivel & Tilting. Write for complete information.

J. E. Martin Machine Co. 548 W. State Springfield, Ohio

Encircle No. 492 on Card, Opposite Page 65



Sure Grip Step Blocks and Stud Sets Clamp Assemblies at low prices.

TIETZMANN TOOL CORPORATION DEPT. C. T. ENGLEWOOD, OHIO

Encircle No. 493 on Card, Opposite Page 65

Fully equipped modern machine shop with extensive Jig Boring, Surface Grinding, Horizontal Boring and Thread Grinding facilities as well as modern Cam Milling and Cam Grinding equipment.

Your Inquiries Answered Promptly

HIMOFF MACHINE CO., INC. 23-22 GGth Road Long Island City 1, N. Y

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Buy safe "SHUR-GRIP"





ned to hold 3 to 6 lb. lead hom heads more firmly - will not slip - keeps hammer head in shape longer — makes re-molding easier, quicker, surer, less expen-

Write for circular and prices LAWRENCE H. COOK, INC. 47 MASSASOIT AVENUE, EAST PROVIDENCE 14, R.

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BURR KEYSEATERS



Mill keyways in the run or on the ends of shafting already erected—save money on altererected—save money on alteration, erecting, and repair work. ALSO

Planer - type MILLER up to 144" table length.

Write for Bulletins and prices.

John T. Burr & Son, Inc. 429 Kent Ave.

Brooklyn, N. Y.

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To Your Specifications except Screw Machine Cams

Design Assistance Offered

KIDDE PRECISION TOOL CORP. ROSELAND, N.J.

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INIATU

Hole Sizes—No. 80 to 3/32"
O.D. 3/32" to 13/64"
Lengths 14" to 3/4"
.0002 Tolerance on I.D.,
O.D., and Concentricity WRITE FOR CATALOG

PREBCO BUSHING CO.

37 St. Joseph St.

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Arcadia, Calif.



THESE HOLES BY A QUICK, EASY, INEXPENSIVE METHOD

Your business letterhead will bring literature WATTS BROS. TOOL WORKS Wilmerding, Pa.

Encircle No. 499 on Card, Opposite Page 65 MACHINE and TOOL BLUE BOOK

New 1/4" basic air valve assembly adaptable to 5 different ways

A versatile new series of four-way 4" valves in which the same basic assembly can reportedly be used as a spring return hand valve, a spring return foot valve, a self-locking bench

No. 301
Hand Valve

No. 302
Foot Valve

No. 305
Bench Valve
Cam Valve
Solenoid Valve

valve, a spring return cam valve and a solenoid-actuated valve.

By regulating the size of the exhaust openings in the valve you can control the speed of a double-acting cylinder in both directions. Valve base and body are aluminum casting; seals are neoprene; springs and plungers are all rustless brass, bronze or stainless steel. Mead Specialties Co., Dept. SV-6, 4114 No. Knox Ave., Chicago 41, Ill.

Use ACTION Card, opposite page 64. Encircle No. 48

Milling machine bushing holds close tolerances

Maintaining close tolerances at high speeds, the Jergens live milling machine bushing is said to eliminate freezing of the arbor and to allow the use of carbide tools to full capacity on both new and old milling machines.

According to the manufacturer, bushings incorporate an absolute seal against coolants and dirt, turn on friction-free

NEW SINGLE SPINDLE AUTOMATIC

"Record A-42"

MAX. TURNING LENGTH
4-3/4"
WITH LONG TURNING
ATTACHMENT 7-7/8"

SPINDLE CAPACITY:

ROUND STOCK 1-21/32"

HEX. BARS 1-7/16"

SQUARE STOCK 1-5/32"

Write for Details:

CEDAR-WEST TOOL CO., INC.

88-90 West St.

New York 6, N.Y.



ACROMARK

FOR

HERCULES HOLDERS

and Shoulder Style Steel Type for numbering.



SPEED

Numbering Machines for consecutive or random numbering in a press.







ACROMARKER

Name-Plate stamping machines are made in several models and sizes for hand or foot operation.



Numbering head shown consecutively numbers steel parts or nameplates. Used in a
punch press, foot
or arbor press, Hand styles also
available.





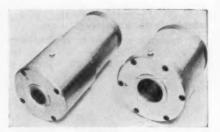
ACROMARK

Series 9A Marking Machines are adaptable to marking just about any product or material. Use straight dies for marking rounds. Roll dies for marking flats.

Write for more complete information on these and other ACROMARK numbering and marking machines.

THE ACROMARK CO.

Encircle No. 501 on Card, Opposite Page 65



roller bearings and are adjustable for wear. These features eliminate constant adjusting, tightening and bushing replacement to maintain precision. J. G. Jergens Div. of Donley Products, Inc., Dept. B, 11106 Avon Ave., Cleveland, Ohio.

Use ACTION Card, opposite page 64, Encircle No. 49

MAKE SPRINGS

in a jiffy!

with

Blaner Universal Hand



SPRING WINDER

Here's a profitable tool

Patent No.

Patent No.

2052443

The pendable . . a real

2052443

Write for your
Circular.

No. 3 size winds up to 11/8" O.D. Costs only \$41.00

THE BLANER MANUFACTURING CO. 307 MUNROE FALLS AVE. GUYAHOGA FALLS, OHIO

Encircle No. 516 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Lightweight paint mask

The flex-a-prene paint mask, reportedly provides positive low cost protection for spray paint operators. It



keeps out paint pigments and solvents and is comfortable to wear, as well as being easy to talk and breathe through. Mask weighs only one ounce and can be worn with goggles or spectacles.

A new filter material, prenex is utilized. Prenex is not affected by paint pigments or solvents and reportedly won't clog, soften, swell or jell . . . even after hundreds of hours of exposure. Flexo Products, Inc., Dept. B, 1468 W. 9th Ave., Cleveland, O.

Use ACTION Card, opposite page 64, Encircle No. 51

Power drive flexible shaft

The Stow Mfg. Co., Dept. RS, 30 Shear St., Binghamton, N.Y., has developed an extra-heavy duty flexible shaft having a core 11/4" in diameter, made up of layers of tightly wound high-grade music wire. With this core, the shaft can transmit up to 1650 lb. in. of torque at 440 rpm.

The heavy duty flexible casing is

RUGGED PRECISION LATHE SEPARATE LEAD SCREW

rison 11" GAP-BED GEARED HEAD PRECISION LATHE

- 24" between centers (also available in 40" centers)
- 1136" swing over ways 41/2"x1834" swing in gap
- 1¼" collet capacity Pre-loaded Timken bearings •Threaded or American taper spindle Loo • Clutch & brake
- With 2 H.P. motor, controls, steady and follow rests. face plate, driver plate, cabinet base and chip pan

AMAZING LO

Made by T. S. Harrison and Sons Ltd., one of **England's foremost** manufacturers of fine machine tools. Send for catalog and price list.



Also 15" swing lathe with outstanding features. including spindle bored to pass 3" diameter bar.

AND PARTS MAINTAINED BY S. REPRESENTATIVE . Stanley Sheppard . 30 Church St., N. Y. 7 AVAILABLE THROUGH YOUR DISTRIBUTOR

Encircle No. 502 on Card, Opposite Page 65



lined with oil tempered spring steel, reinforced with wire braid, covered with
oil resistant neoprene impregnated
fabric and an abrasion resistant rubber
jacket. The casing serves as the bearing surface for the core and also retains
the lubricant. If desired, extra reinforcement can be put on one end as
shown. Steel-backed bronze sleeve
bearings at each end of the shaft allow
the core to float inside the casing.

Use ACTION Card, opposite page 64. Encircle No. 52

Plunger toggle clamp exerts 10,000 lb. pressure

The Caddy P-5 plunger toggle clamp, with 10,000 lb, horizontal clamping pressure, has recently been announced by Erico Products, Inc., Dept. B, 2070 E. 61st Place, Cleveland 3, Ohio.

Other features include extra large pivot pins; all welded construction—will not come apart even after pins become excessively worn; heavy steel frame—will not spring or bend under maximum load; 2-15/16" stroke.

Use ACTION Card, opposite page 64, Encircle No. 53



Angle-mounted speed lathe

A new type of Schauer speed lathe, designed to debur and polish a small part, has the pedestal inclined 20 degrees to provide maximum ease and comfort of operation. The work, held by a collet, is completely enclosed by a safety cover, contoured to the shape of the work. The machine cannot be started until the safety cover is in the closed position.

Operation sequence of the machine is as follows: Work is placed on the hold-



ing fixture and guard is closed. The operator actuates the control button and the part is rotated at slow speed for a pre-determined time. At the completion of the slow speed time, the machine automatically shifts to a high spindle speed for an additional pre-set time period, then stops. The operator lifts the guard and removes the work. Schauer Mfg. Corp., Dept. HS, Cincinnati 36, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 69

High-torque set screws

A new line of high-torque Unbrako set screws, that can be torqued up to 40 percent tighter, has been developed by Standard Pressed Steel Co., Dept. RS, Jenkintown, Pa. Fasteners incor-



porate design and fabrication advances—including fully formed threads, stronger, deeper sockets and tighter over-all tolerances—that permit them to go into a hole easily, stay in place even under severe vibration.

Use ACTION Card, espesite page 64, Encircle No. 31

Carbide lapping machine

A new finishing machine for carbide tools has been announced by the Wickman Mfg. Co., Dept. MTB, 10325 Capital



THRIFTMASTER Universal Joint Type DRILL HEADS

have these exclusive* features

*Standard Full Ball Bearing Construction, including Spindles

Driving assembly is Full Ball Bearing mounted with 3 Bearings on each spindle. Thrust load earried by radial thrust bearings.



*Standard Slip-On and Slip-Off Template Construction

For accurate setting and locating spindle brackets are machined to receive slip-on and slip-off template.

6 Standard Models . . . Models U-608 and U-1000—Ball Bearing. Models U-620B and U-1012B—Plain Bearing, 11/16" or ½" min. centers. Models U-608-BS and U-1000-BS—Ball Bearing Gear Case, Plain Spindles.

Semi-Standard Heavy Duty Full Ball Bearing . . 1/2" in Cast Iron—1-7/16" min. centers—1/8" or 93/4" dia.

 $\frac{1}{2}$ " in Steel—1-13/16" min. centers—7" or $9\frac{5}{6}$ " dia.

Also Larger Adaptations and Full Line of Fixed Center Drill Heads.

WRITE FOR FULL INFORMATION

Subsidiary of Thomson Industries, Inc.
THRIFTMASTER Products Corporation

1030 N. PLUM STREET LANCASTER, PENNA.

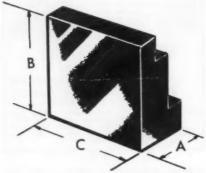
Also Makers of DORMAN AUTOMATIC REVERSE TAPPERS Ave., Detroit 37, Mich.

The machine operates on the principle of a small diamond impregnated finishing hone lapping the cutting edge of the carbide tool with a reciprocating movement in four directions in a vertical plane until the required finish is obtained. Lubrication is provided to the finishing stone by means of a builtin self-priming pump.

Use ACTION Card, epposite page 64. Encircle No. 72

Self-proving angle plates

Angle plates made of diabase (black granite), on which the accuracy of each 90° angle can be proved without reference to a master, have been announced by Rahn Granite Surface Plate Co., 639 N. Western Ave., Dayton 7, O.



Since no compensating hump will be raised when accidentally nicked, there is no danger of an unnoticed burr causing an error in an inspection, the manufacturer claims. Angles are produced in two grades: inspection grade-50 millionths accuracy each angle; laboratory grade-25 millionths accuracy each angle.

Use ACTION Card, opposite page 64. Encircle No. 73

Rotary cutting and deburring tools

Severance Tool Industries Inc., 722 Iowa St., Saginaw, Mich. have added a 3/16" shank diameter series to their Carbo-Mill line and five new sizes and 1 new shape to round out their 4" shank series.

Carbo-Mills are rotary cutting and deburring tools with solid carbide cutting heads. They can be used in the same power tools and at the same speeds as high speed rotary files and midget mills. They are recommended for the production deburring and machining of parts made of materials that are abrasive or tough, or having hardness up to 60 C Rockwell.

Use ACTION Card, opposite page 64. Encircle No. 74





FOR RETAINING DRILL JIG BUSHINGS USE B-K 7# CEMENT

No distortion of the jig plate or misalignment of the hole pattern. Eliminates lapping of press fit bushings after assembly. Not affocted by drilling heat. Bushings can be retained in steel. aluminum or fibergias jigs. Easily applied by untrained personnel. Especially recommended for use in "master tooling" operations.



Encircle No. 504 on Card, Opposite Page 65

Numerically Controlled Turret Lathe



Completely controlled by a punched tape, this machine is automatically cycled and provides rectilinear motions with precise controls to the end points. The tape also controls spindle speed; indexing of the six position turret to any face at any time; indexing of four position turret to any face at any time; operation of hydraulic powered collet chuck and bar feed; turning coolant on or off; opening or closing hood; resetting

of tape to repeat cycle.

Binary number coding is used, for a maximum utilization of tape space. Tools are preset to gages for given dimensions. This combination makes it possible to obtain a drawing, code the necessary information, punch a tape, plug in the preset tools and make the part without further tool adjustment. Jones & Lamson Machine Co., 522 Clinton St., Dept. 710, Springfield, Vt.

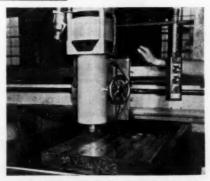
Use ACTION Card, opposite page 64. Encircle No. 75

Milling head for planers

A motorized spindle for conversion of planers and old milling machines to high speed carbide milling is being offered by the Detroit Milling Cutter Co., Dept. B, 28625 Grand River, Farmington, Mich., for use with their indexable carbide milling cutters.

Driven by a 20 hp, 1200 rpm, glass wound, fan cooled motor, spindle is connected directly to the rotor of the motor, thus eliminating all gears. Vertical adjustment is by ways rather than a spline.

A choice of four table feeds ranging from 30 to 120 inches per minute is available. A Loadmeter will shut off



the feed motors if the spindle is seriously overloaded.

Use ACTION Card, apposite page 64, Emeirele No. 76

Hand snap gages

The model SGA hand snap gage has a built-in .010 range fine adjustment to facilitate setting the up for measurement and to keep the indicator hand at the ideal position of 12 o'clock while gaging.

Another feature is the backstop mounted at a 45 to provide a stop position that is claimed to be always on



center for the full range of the gage.

Standard on the gages are tungsten carbide anvils, the upper anvil radiused and the bottom anvil flat. A tool steel spring for operating in a guide reportedly insures accurate movement of the sensitive upper contact.

Standard sizes cover the ranges from 0" to 14" in nine sizes. The Acra-ment Gage Division of Myer Corp., Dept. B, Park Ave., Cranston, R.I.

Use ACTION Card, opposite page 64. Encircle No. 121

New collet packaging technique

A new method of packaging collets for their Multi-Drill, Select-A-Spindle and Multi-Angle drill unit has recently been adopted by Commander Mfg. Co., Dept. MTB, 4225 W. Kinzie St., Chicago.

Crystal clear plastic boxes and vials, which afford instant identification of the contents, are being used. They are shatterproof, keep the contents clean

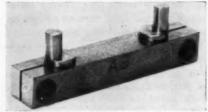


and free from moisture, and can be used in the shop or tool room as permanent storage containers.

Use ACTION Card, opposite page 64. Encircle No. 122

Gage measures inside and outside dimensions of cylindrical and rectangular parts

An adjustable pin, or button type gage for measuring both inside and outside dimensions of both cylindrical and rectangular parts, Snappergage provides inside measurements from .100"



to 3.500" and outside measurements from .000" to 3.400".

By simply turning the eccentric gaging buttons and locking them in the desired position, unit can be set to gage blocks or micrometers. A clamping assembly is available with a red and green spacer for color identification of go and no go sides, together with clamps providing space for marking, making possible their use in pairs. Ames Instrument Co., Dept. B, Concord, Mass.

Use ACTION Card. epposite page 64. Encircle No. 123

SPECIAL MONTH ONLY

• STOCK LIST •

IMMEDIATE DELIVERY

BRAND NEW TAPER SHANK TWIST DRILLS H.S.S. — REGULAR

MADE BY WELL KNOWN U.S.A. MFR.

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Sixe	Morse Toper	Consumers'	Discount
9/32	No. 1	\$ 1.35	50%
7/16	No. 1	2.07	40%
1/2	No. 2	2.68	35%
17/32	No. 2	2.96	35%
9/16	No. 2	3.40	35%
5/8	No. 2	3.87	35%
11/16	No. 2	4.78	35%
21/32	No. 2	4.32	40%
23/32	No. 2	5.24	50%
25/32	No. 2	5.94	50%
13/16	No. 3	6.62	35%
7/8	No. 3	7.34	35%
29/32	No. 3	7.71	40%
15/16	No. 3	8.08	35%
1"	No. 3	9.37	35%
1- 1/32	No. 3	10.05	50%
1- 1/16	No. 3	10.74	35%
1- 3/32	No. 4	12.10	50%
1- 1/8	No. 4	13.03	35%
1- 5/32	No. 4	13.72	50%
1- 3/16	No. 4	14.40	40%
1- 1/4	No. 4	16.46	35%
1- 9/32	No. 4	18.30	50%
1- 5/16	No. 4	18.97	40%
1-23/64	No. 4	20.35	40%
1- 3/8	No. 4	20.35	35%
1-25/64	No. 4	21.04	40%
1- 7/16	No. 4	21.72	40%
1- 1/2	No. 4	23.10	35%
1- 9/16	No: 5	28.12	40%
1-5/8	No. 5	31.10	40%
1-3/4	No. 5	35.68	40%
2"	No. 5	45.75	35%

SEND US YOUR REQUIREMENTS ON OTHER SIZES - WE WILL QUOTE!

DE WITT TOOL CO., Inc.

190 ELIZABETH AVE.

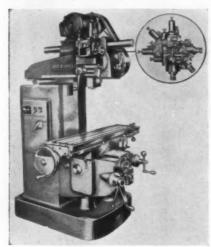
NEWARK 8, N. J.

Bigelow 3-6995-6

Encircle No. 505 on Card, Opposite Page 65

Ram type miller features quill adjustable cutterhead

The Van Norman ram type miller No. 16S has quill adjustable cutterhead that permits horizontal, angular and vertical milling plus boring and drilling on one machine without attachments. Machine gives the equivalent of two separate millers plus attachments.



Cutterhead has a 4" quill travel; 3 quill power feed, :005, .003 and .006. Eight spindle speeds, 110 to 3600 rpm; cutterhead spindle motor, 2 hp; table size, 40½"x10"; power table travel, 22"; hand cross feed, 10"; hand vertical feed, 22"; ram movement in and out over column, 20½". Van Norman Co., Dept. DR, 3630 Main St., Springfield 7, Mass.

Angle gage blocks

Webber Laboratory Master angle gage blocks are claimed accurate to ¼ second. Made of steel, they are checked for accuracy in a constant temperature of 68° against master blocks which have been calibrated by optical means to an accuracy of .1 second.

These angle gage blocks have been



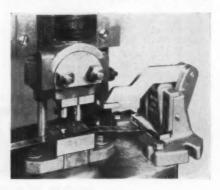
specifically designed for use as standards of measurement for auto collimators, spectrometers, etc. They are also recommended for use in the optical, aircraft, guided missile and precision instrument industries. Each set contains 16 blocks. Webber Gage Co., Dept. RH, 12912 Triskett Rd., Cleveland 11, Ohio.

Use ACTION Card, epposite page 64, Encircle No. 67

Ram operated scrap chopper

The Durant M-3 ram operated scrap chopper will handle material up to 10" in width and up to .100 in thickness. Durant Tool Supply Co., Dept. BB, 136 S. Water, Providence, R.I.

Use ACTION Card, opposite page 64, Encircle No. 68



The MARKET PLACE

Advertisements acceptable in THE MARKET PLACE include those for employment, sales services, production facilities, representation and related needs. Rates: \$20 per column inch per insertion. Maximum size advertisement accepted in this section is three inches.

Copy should reach us by the first of the month for next month's issue.

MACHINE and TOOL BLUE BOOK

A Hitchcock Publication

Wheaton, Ill.

175 HEX-E-CASE

Complete

with 10 wrenches.
Fits all sizes from No. 2 cap. to 34-inch set.
Wrenches will not fall out.



HARTWYK MFG. CO.

360 Glenwood Ave., East Orange, N.J. Encircle No. 506 on Card, Opposite Page 65

WANTED

Manufacturer of Tools and light machinery wants new item. Have over 3000 active distributors on present line. Established over 30 years.

Address replies to Box 297, c/o MACHINE & TOOL BLUE BOOK Wheaton, III.

Encircle No. 507 on Card, Opposite Page 65 Self-adjusting, tubular steel wrench

The Stilsomatic Red Snapper pipe wrench features: tubular steel construction; automatic adjusting, rocking fulcrum action; spring loaded hook jaw; light weight.

Forged from high carbon steel, tempered for maximum strength, durability and lightness. Rocking Fulcrum action allows a number of different pipe fits with only one adjustment. Once the jaws are placed on a pipe the spring loaded hook jaw exerts a constant pres-

Make your own Storage & Pallet Racks



with Amidon Fittings and one inch pipe.

Amidon Engineering Co. ELYRIA 10, OHIO

Encircle No. 508 on Card, Opposite Page 65

Powerful, Permanent, Personal



Retrieves dropped screws, needles or parts.
Removes chips and filings from threads, ways
and blind holes. Gathers and holds ball bearmany ings, etc. Identifies magnetic material, etc.
times its Shipped postpaid for 81,00. Order now.
weight
Spring Specialty Co. • 21 Fifth Ave., Maywood, Ill.

Encircle No. 509 on Card, Opposite Page 65

sure and will hold the wrench in place, thus requiring only one hand for any operation. Sizes: 12", 14", 18", 24", 36", 48". Stilsomatic Sales Corp., Dept. RS, 1100 20th St., N.W., Washington 6, D.C.



Mechanics Through The Ages



The point of no return!



Cri-Dan "B" Single Point, High-Speed Threading Machine CAPACITIES

Spindle speed (in 24 steps)	.145-2800 R.P.M
Swing over Saddle	.4"
Swing over Bed	.13"
Capacity between Centers	.36"
Maximum Standard Thread Length	.21/2"
Rated Capacity	8TPI - 40 TPI
Maximum number of Thread Starts	.12
Maximum Taper Thread	25° Included

If your threading operations have reached the point of low return through loss of speed and accuracy, the Cri-Dan "B" can solve your problems.

The Cri-Dan "B" utilizes a single carbide-tipped point that generates threads with speed and accuracy unmatched by any other threading method. That's why we call it the "POINT of *High* Return".

One example of Cri-Dan's versatility is a facing attachment which enables the Cri-Dan "B" to face and thread in one fast operation.

Your Lees-Bradner representative has all the facts on the amazing Cri-Dan "B". Ask him to show you how your threading operations can become YOUR point of high return.

CRI-DAN DIVISION

The LEES-BRADNER.

CLEVELAND 11, OHIO, U.S.A. COMPANY

X

Whatever You Need, You'll Find It Here

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Acoustic Devices, 108
Adapters, 88, 250, 322
Air Control Equipment, 3, 67, 123, 249
Alloys, 70-71, 87, 154
Aluminum, 87
American Society of Tool Engrs. Show, 28
Angle Blocks, 117
Angles, 117, 293

В

Balancing Machines, 13, 54-55, 120 Band Saw Machine Accessories, 297 Bar Feeds, 29, 257 Bar Pointers, 332 Bars, 87, 154
Bases, Index, automatic, 308 Beading Machines, 298 Bearings, 197 Bearings, ball, 197 Bearings, needle, 145 Bearings, roller, 197 Belts, 203 Belt Sanders, 327 Benches, work, 114 Bending Equipment, 82, 287, 290, 315, 325 Bending Rolls, 325 Blanks, circular form tools, 64 Bolts, 329 Boring Bars and Tools, 79, 104 Boring Chucks, 228 Boring, Facing Tools, 311 Boring Heads, 104, 299, 311 Boring Machines, 11, 16-17, 51, 148 Boring Tools, 10, 294 Brakes, box & pan, 287 Brakes, box finger, 132 Brakes, press, bending, 22-23, 46, 213, 287 Brass Stock, 61 Broaches, 263 Broaching Attachments, 263 Broaching Machines, 263 Burring Machines, 177 Burrs, 315 Bushing Bonding Cement, 340 Bushings, drill, 274, 334 Bushings, drill jig. 312, 322 Bushings, guide pin. 141 Bushings, rotary, 330

C

Calipers, 296 Cam Grinding, Cam Milling, 333, 334 Cams, 291, 333, 334 Carbide Stock, 70-71 Carbide Tools, 67, 73, 241, 265, 305, 315 Cement, 340 Centers, Anti-Friction, 94 Centers, live, 277, 290, 305, 309, 311, 316 Cermets, high temperature, 70-71 Chamfering Machines, 177, 332 Chasers, 280 Chucks, 57, 77, 103, 254, 270 Chucks, collet, 254, 330 Chucks, scroll, 57 Circular Cutting Tools, 67, 69 Clutches, 86, 351 Coil Cradles, 198 Cold Forged Parts, 93 Cold Roll Forming Machines, 92 Collet Controller, 1 Collets, 180, 254 Comparators, dial, 293 Contract Manufacturing, 109, 252, 333, 334 Coolant Systems, 118 Coolants, 14, 50, 223, 253, 315, 333 Counterbores, 47, 67, 73, 265 Countersinks, 69, 73, 315, 332, 359 Cut-off Blades, 207 Cut-off Machines, 59, 205, 286, 293, 298 Cutters, 16-17, 111, 290, 357, 359 Cutting Fluid, Oils, 14, 50, 223, 253 Cutting Tool Materials, 98 Cutting Tools, 24-25, 40, 50, 58, 315, 349, 357 Cylinders, hydraulic, pneumatic, 189

D

Demagnetizer, 298
Dial Indicators, 126
Diamond Tools, 294
Diamond Wheels, 196
Diamonds, industrial, 136-137
Die Casting Machines, 32-33
Die Cushions, 45
Die Heads, 227, 280
Die Making Machines, 31
Die Set Pullers, 828
Die Sets, 12, 30, 128, 147, 333
Dies, 26, 128, 188, 227, 238, 357
Dies, magnetic, perforating, 128
Dies, progressive, 238
Dieske, master setting, 109
Dressers, 90-91, 294

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SPEED SPECIAL SIZE MILLING



SIDE MILLING CUTTERS

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IN STOCK FOR IMMEDIATE DELIVERY!

DIAM-	OF FACE	SIZE OF HOLE	PRICE
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4	15/16	1	22.95
4	- 1/8	1-1/4	23.65 25.75
1	1 - 1/4	1-1/4	28.35
5	1/4	100/4	17.50
5	5/16	i	17.80
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Dressers, tool, 136-137 Dressers, wheel, 228 Dressing Tools, 136-137, 294 Drill Blanks, 259 Drill Bushings, 274, 312 Drill Drivers, 77 Drill Feeds, 35 Drill Heads, 271, 279, 339 Drill Heads, Multiple Spindle, 271, 279, 339 Drill Press, Micro. 235 Drill Spindles, multiple, 250 Drilling Attachments, 35, 310 Drilling Machines, 85, 54-55, 123, 332 Drilling Machines, bench, 112-113, 236
Drilling Machines, column, 222
Drilling Machines, horizontal, 11
Drilling Machines, radial, 112-113, 130 Drilling Machines, radial, 112-113, 1-222, Inside back cover
Drilling Machines, table, 27
Drilling Machines, upright, 130
Drilling Units, 54-55, 309
Drills, 43, 47, 69, 73, 259, 349, 357 Drills, carbide, 73 Drills, core, 67 Drills, twist, 343 Drive Assemblies, 250 Drive Shafts, 250 Drivers, floating, 228 Drivers, tap. 77 Duplicating tables, 289 Duplicators, 83, 132 Dust Control, 3, 249 Dye, inspection, 232 Dye, layout, 298, 317

E

End Mills, 40, 67, 199, 315, 357 Engravers, 65 Etchers, 296 Extensions, 88

F

Fabricating Machines, 48-49 Face Mills, 50 Facing Heads, 290, 311
Facing Tools, 265
Feed Fingers, 180 Feed Units, 251 Feeders, parts, 231, 327 Feeds, index, 198 Feeds, slide, 332 Feeds, slide, 33 Files, 229, 359 Files, rotary, 315 Filing Machines, Saw, 307 Fittings, 345 Fixtures, 117 Flexible Shaft Equipment, 125, 248 Flexible Shaft Machines, 248 Floor Cleaners, 316 Floor Plates, 87
Floor Plates, 87
Forming Flatures, 68
Forming Machines, 26, 298
Forming Machines, Cold Roll, 92 Forming Tools, 64, 136-137 Furnaces, heat-treating, 193, 223, 300, 303, 313 Furnaces, industrial, 313

G

Gage Blocks, 100, 109
Gages, 117, 240, 293, 296
Gages, carbide, 44, 109
Gages, depth, 234
Gages, dial, 124, 128, 234, 240, 298
Gages, dial bore, 240
Gages, height, 298
Gages, mero height, 298

Gages, micrometer, 126 Gages, plug, 109, 240, 322 Gages, ring, 322 Gages, snap, 124 Gages, thread, 110 Gang Slitting Lines, 92 Gear Hobbers, 175 Gear Machines, 177 Gear Production Equipment, 260-261 Gear Shapers, 260-261 Gears, 296 Gears, helical, 296 Gears, spiral, 296 Gears, worm, 296 Grinders, 51, 90-91, 99, 121 Grinders, air, 115 Grinders, bench, 187, 268 Grinders, carbide tool, 56, 268 Grinders, centerless, 8-9 Grinders, center type, 8-9 Grinders, chamfer, 127 Grinders, cylindrical, 58 Grinders, drill, 18-19, 31, 127 Grinders, electrical discharge, 97 Grinders, face mill, 31 Grinders, flute, 127 Grinders, horizontal, 99 Grinders, internal, 34, 51, 56 Grinders, jig, 26 Grinders, micro-centric, 8-9 Grinders, oilstone tool, 302 Grinders, pedestal, 268 Grinders, portable, air, 115, 282 Grinders, rotary, 56 Grinders, saw blade, 307 Grinders, surface, 27, 56, 99, 187, 121, 214 Grinders, template tool, 31 Grinders, tool, 302 Grinders, tool & cutter, 31, 83, 121 Grinders, vertical spindle, 99 Grinders, wet or dry, 187 Grinding Heads, 26 Grinding Fixtures, 119 Grinding Wheel, 80-81, 85, 90-91, 96, 198, 211, Grinding Tools, 241 Grooving Tools, 58

H

Hacksaws, band & power, 84
Hammers, soft-faced, 331
Handles, 334
Hardness Testing Equipment, 89, 333
Hinges, 318
Holders, 1, 70-71
Holders, tool, 4, 70-71, 278
Holders, work, 1
Holding Fixtures, 1
Honing Machines, 355
Horizontal Boring, 334

- 1

Index base, 308
Index Feeds, 198
Index Feeds, 198
Index Fixtures & Tools, 314
Index Tables, 291
Index Chassis, transfer type, 258
Index Units, 309
Industrial Supplies, 87
Industrial Wipers, 52-53
Insert Chasers, 280
Inserts, 70-71
Inspection & Measuring devices, 108, 293
Inspection Dye, 232
Inspection Units, 108, 298

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Keys, machine, 314 Keys, woodruff, 314 Keyseaters, 316, 333, 334 Knurling Tools, 319

Lapping Machines, 8-9, 121, 255 Lapping Machines, centerless, 129 Lapping Service, 109 Lathes, 27, 34, 38-39, 72, 105, 112-113, 272, 337, Inside back cover Lathes, automatic, 13, 120 Lathes, fluid tracer, 219 Lathes, geared head, 387 Lathes, hand, 2 Lathes, precision, 272, 337 Lathes, Sebastian, 105 Lathes, speed, 241 Lathes, tracer, 219 Lathes, turret, 2, 13, 102, 120, 242 Layout Dye, 298, 317 Layout Plates, 304 Lead Screw Tapping Unit, 106 Lever Shears, 333 Light Wave Equipment, 109 Lighting Equipment, 226, 268 Links, magnetic adjustable, 265 Louvering Machines, 298 Lubricants, 383 Lubricators, 183

Machine Keys, 314 Machine Racks, 314 Magnetic Clamps, 265 Magnetic Recording Equipment, 108 Magnets, 345 Marking Devices, Stamps, 336 Marking Equipment, 296, 336 Marking Machines, 336 Metal Cutting Machines, 123, 257 Milling Cutters, 111, 349 Milling Heads, 10 Milling Machine Attachments, 195, 241
Milling Machines, 11, 16-17, 27, 51, 60, 63, 105, 148, 198, 241, 267 Milling Machines, horizontal, 11, 83 Milling Machines, hydraulic, 267 Milling Machines, planer type, 222 Milling Machines, ram type, 195 Milling Machines, turret, 195 Milling Machines, vertical, 10, 38-39, 76, 83 Mills, 359 Mills, jig, 148 Mills, pipe & tube, 92 Mills, Shell End, 50 Motors, shaftless, 185 Mounted Wheels and Points, 98-91 Mounting Pads, 247

Nibbling Machines, 48-49, 298 Notching Equipment, 48-49, 325 Numbering Machines, 336 Nuts. 822

Optical Flats, 109 Optical Inspection Devices, 323

Pads. 180 Pantographs, 65, 83 Paper Products, 52-53 Parallels, 293, 304 Piercing Machines, 26 Piezo Electric Materials, 108 Pipe Fittings, 345 Planers, 11 Plastic Stock, 196 Plastic Tooling, 26 Plate Machinery, 36-37 Plates, 87, 154 Plates, angle, 304 Plates, surface, 90-91, 305 Pointing Machines, 177
Portable Air Tools, 115, 282, 306
Portable Electric Tools, 241, 306
Portable Wheela, 196 Porting Tools, 265 Power Take-Off, 86 Precision Ground Parts, 93 Press Brakes, 45, 46, 287 Presses, arbor, 78, 278 Presses, assembly, 278 Presses, bench, 7, 296 Presses, broaching, 278 Presses, combination, 122 Presses, deep-throat, 36-37, 243 Presses, die tryout, 301 Presses, double crank, 285 Presses, drill, 38-39, 235 Presses, forming, 278, 296 Presses, four-slide, 122 Presses, gap type, 78, 285 Presses, gear, 7, 36-37 Presses, guided platen, 78 Presses, hand, 78 Presses, high speed, 285 Presses, horn, 243 Presses, hydraulic, 45, 78, 278 Presses, inclinable, 46 Presses, mechanical, 45 Presses, riveting, 296 Presses, stamping, 296 Presses, straightening, 278 Presses, transfer, 134 Pressure Sensitive Tapes, 90-91 Production Machines, 54-55 Production Tools, 250 Pumps, coolant & lubricant, 118, 264, 315 Punches, 93, 315, 325 Punch Press Guards, 831 Punches & Dies, 188 Punching Equipment, 48-49, 315 Pushers, 180

Quills, 241

S

Safety Devices, 331 Saw Blades, band, 21, 215 Saw Blades, circular, 222 Saw Blades, hack, Inside front cover, 84, 239, 324 Saw Filing Machines, 307 Saw Frames, hack, 84 Saw Sharpeners, 222 Sawing Machines, 69, 222, 257, 293 Sawing Machines, band, 262 Sawing Machines, band, accessories, 297 Sawing Machines, cut-off, 59, 69, 293 Sawing Machines, back, Inside front cover, 27, 84 Saws, carbide-tipped, 69 Saws, circular, 69 Saws, metal-cutting, 84, 123 Saws, alitting, 50 Scrap Cutters, 283, 302 Screw Drivers, clutch electric, 95 Screw Drivers, power, 95, 306, 327 Screw Machines, automatic, 32-33, 95, 335 Screw Machines, Swiss type, 83 Screws, 74-75, 266 Screw Sets, transfer, 293 Screws, cap, set, socket & machine, 74-75, 93, 266 Shanks, Morse taper, 357 Shapers, 22-23, 27, 105, 213 Shapers, gear, 260-261 Sharpening Stones, 90-91 Shears, 22-23, 36-37, 213, 315, 325, 326 Shears, lever, 333 Sheet Metal Dies, 93 Sheet Metal Machinery, 36-37 Sheets, 87, 154 Shrinking Machines, 298 Sintered Metal Products, 196 Sleeves, 322 Slide Feeds, 832 Slitting Saws, 50 Slitting Machinery, 326 Slotters, 241, 298, 326, 332 Small Tools, 83 Socket Screw Products, 74-75, 266 Sockets, 88 Soldering Equipment, 296 Special Machinery, 13, 26, 46, 117, 119, 129, 222, 251, 258, 309, Back cover Special Tools, 26, 67, 73, 315 Speed Reduction Units, 256, 302 Spindles, 51, 66 Square Hole Drills, 334 Squares, engineer, 41 Stainless Steel, 70-71, 87, 154 Stamping Service, 252 Steady Rests, 228
Steel and Steel Stock, 70-71, 87, 98, 154, 237 Steel Blue, 298, 317 Step Blocks, 334 Stock Straighteners, 198

Stops. stock, 180
Straight Edges, 293, 304, 316
Straighteners, 198
Straighteners, 198
Straightening Rolls, 325
Stretching Machines, 298
Structurals, 87, 154
Stub Boring Tool Sets, 79
Stud Sets, 334
Subland Tools, 45
Sump Cleaners, 315
Superfinishers, 13, 120
Surface Finish Standards, 127
Surface Grinding, 334
Surface Plates, 90-91, 109, 293, 304
Swaging Machines, 145

T

Tables, duplicating, 289
Tables, elevating, adjustable, 171, 297
Tables, rotary, index, 26, 291 Tap Drivers, 77 Tap Holders, 106, 310 Tap Units, 309 Taper Pins, 314 Tappers, 307, 310 Tappers, automatic reverse, 339
Tapping Attachments, 106, 116, 230, 307, 310
Tapping Heads, 106, 279, 307
Tapping Machines, 54-55, 173, 230, 288, 307
Tapping Units, 230 Taps, 24-25, 349, 357 Taps, collapsible, 143 Thinners, drill point, 31 Thread Dressing Tools, 136-137 Thread Gages, 110 Thread Grinding, 334 Thread Measuring Wires, 109 Thread Rolling Machines, 15, 216 Threaders, 332 Threading Machines, 347, Back cover Threading Tools, 58 Tips, 70-71 Tool Bits, 98 Tool Holders, 4, 70-71, 278 Tool Steels, 237 Tooling Service, 329 Tools, 70-71 Transfer Machines, 12, 22, 26, 251 Transfer Screw Sets, 293 Trouble Detector, 298 Tube Deburring Cutters, 359 Tube Shears, 286 Tubing, 87, 154 Turning Tools, 58

U

Universal Joints, 250

٧

Valves, 107, 139, 189
Valves, air, 107, 189
Ventilating Equipment, 123
Vernier Calipers, 296
Vises, bench & machine, 116, 290, 317, 334

W

Welding Equipment & Supplies, 101 Wheel Dressers, 90-91, 228 Wheels, grinding, 80-81, 85, 90-91, 96, 196, 211, 233 Wire Fabric, 87 Work Benches, 114 Wrenches, 295, 345 Wrenches, automatic, 295

Index to Advertisers

Abart Gear and Machine Company302 274 259 Acme Danneman Company, Inc. (Danneman Die Set Division) 333 278 Acme Tool Company Acromark Company 336 Aget Manufacturing Company 249 Alina Corporation 296 Allegheny Ludlum Steel Corporation . 98 Alled Products Corporation 296 Allied Products Corporation 93
Alpha Press & Machine, Inc. 301
American Brass Company 61
American Chain & Cable Company 59
(Campbell Machine Division)
American Chain & Cable Company 89
(Wilson Mechanical Division)
American Saw & Manufacturing Co. 215
American Society of Tool Engineers 28
American Tool Works Co. Inside Back Cover
Ames Company, B. C. 126
Amidon Engineering Company 345
Anderson Bros. Manufacturing Company 283
Apex Machine & Tool Company 88
Armstrong-Blum Mig. Co. Inside Front Cover
Armstrong Brothers Tool Company 4
Arter Grinding Machine Company 56
Atlas Press Company 38-39 93 Atlas Press Company38-39 (Clausing Div.) Auto Moulding and Manufacturing Co.318

R

Balas Collet Manufacturing Co	.18
Baldor Electric Company	261
Beaver Gear Works, Inc.	.291
Bellows Company	
Benchmaster Manufacturing Company	
Bentley Industrial Corporation	. 2
Beverly Shear Manufacturing Company	320
Blake Company, Edward	12
Blanchard Machine Company	.21
Blaner Manufacturing Company	33
Bokum Tool Company	. 51
Boyar-Schultz Corporation	.329
Bremil Manufacturing Company	.333
Bridgeport Machines, Inc.	.19
Brightboy Industrial Division	. 91
(Weldon Roberts Rubber Company)	
Brown & Sharpe Manufacturing Co	.11
Brush Electronics Co	100
Bryant Chucking Grinder Company	.110
Buck Tool Company	. 5
Buffalo Forge Company	.123
Bury & Son, John T.	334
Busch Company, J. C.	.29

C

Compact Machine Division	. 03
(American Chain & Cable Company)	
Capewell Manufacturing Company	239
(American Chain & Cable Company) Capewell Manufacturing Company Carborundum Company 178 Carroll & Jamieson Machine Tool Co.	-179
Carroll & Igmieson Machine Tool Co.	318
Carter Products Company, Inc.	297
Cedar-West Tool Company	335
Challenge Machinery Company	114
Chandler Tool Company	211
Chicago Latrobe	72
Chicago Ougdrill Company	071
Chicago Quadrill Company	4/1
Chicago Rivet & Machine Company	20
Chicago Tool & Engineering Company	290
Chicago Wheel & Manufacturing Co	0-81
Cincool Division (Cincinnati Milling Machine Company)	223
(Cincinnati Milling Machine Company)	
Cincinnati Bickford Tool Company	130
Cincinnati Grinders, Inc.	8-9
Cincinnati Lathe & Tool Company112	-113
Cincinnati Milling Products Division	233
(Cincinnati Milling Machine Company)	
Cincinnati Shaper Company22-23,	213
Circular Tool Company	69
Cleveland Automatic Machine Co	12-33
Clipper Diamond Tool Company	294
Collins Microflat Company	304
Collins Microflat Company	329
Commander Manufacturing Company	307
Comtor Company	240
Concentric Tool Corporation	211
Concellidated Machine Tool Company	0 10
Continental Teel Weeks	0-13
Consolidated Machine Tool Company	Z63
Common Clutch Comporation)	251
Conway Clutch Company	351
Cook, Incorporated, Lawrence H.	334
Cook & Chick Company	327
Coolant Equipment Corporation	315
Cooper Weymouth Company	332
Crane Packing Company	255
Criterion Machine Works	104
Cross Company	177
Cross & Son, Herbert	290
Crucible Steel Company of America	237
	-

D & M Guard Company	331
Dake Corporation	78
Danly Machine Specialties, Incorporated	12
Danneman Die Set Division	333
(Acme Danneman Company)	
Davis Keyseater Company	316
Dayton Rogers Manufacturing Company	252
Dazor Manufacturing Corporation	269
Detroit Die Set Cornoration	147

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DeVlieg Machine Company	Gisholt Machine Company 13, 120 Gorton Machine Company, George 83 Grant Manufacturing & Machine Co. 302 Gray Company, G. A. 11 Greaves Machine Tool Division 63 (J. A. Fay & Egan Company) Green Instrument Company 65 Greenerd Arbor Press Company 278 Greist Manufacturing Company 298
	н
Eastern Machine Screw Corporation 280 Economy Tool & Machine Company 322 Eisler Engineering Company, Inc. 291 Elox Corporation of Michigan 97 Empire Tool Company 207 Errington Mechanical Laboratory, Inc. 310 Essex Rotary File & Tool Corporation 315 Ex-Cell-O Corporation 263 (Continental Tool Works)	Hall Manufacturing Company 33(Hamilton Tcol Company 171, 173, 175 Hammond Machinery Builders 3 Hardinge Brothers, Inc. Back Cover Harig Manufacturing Corporation 115 Hartwyk Manufacturing Company 345 Haskins Company, R. G. 122 Heimann Manufacturing Company 225 Heiler Machine Company 225 Hendley and Whittemore Company 325 Himoff Machine Company 326 Hirschman Company, Inc., Carl 244 Horton Chuck 277 Huppert Company, K. H. 303
F	
	1
F and D Tool Company, Inc. 40 Falls Products, Inc. 305	
Fellows Geur Shaper Company 260-261 Felters Company 247 Fen Machine Company 295 Ferracute Machine Company 46 Firth-Sterling, Inc. 70-71 Fiske Brothers Refining Company 253	Index Machine Company
Flynn Manufacturing Company	
Fulflo Specialties Company, Inc118	,
Fulmer Company, C. Allen355	Jacobs Manufacturing Company 25- Jahn Manufacturing Company, B. 23i Johnson Gas Appliance Company 31i Johnson Machine & Press Corporation 28i Johnson Manufacturing Corporation 26i Jones & Lamson Machine Company 22i
Galland-Henning Manufacturing Co. 189 Gatco Rotary Bushing Company 330 Gates Rubber Company 203 General Pacific Corporation 35 Giddings & Lewis Machine Tool Co. 79 (Davis Boring Tool Division)	Kalamazoo Tank & Silo Company

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Encircle No. 514 on Card, Opposite Page 65

Kalins and Company, J. M., 289 Kaufman Manufacturing Company 288 Kent Machine Company 332 Kent-Owens Machine Company 267 Kidde Precision Tool Corporation 333-334 King, Andrew 333 Kitsman Manufacturing Company 331	New York Twist Drill Company Niagara Machine and Tool Works	36-37 60 229 316 122 183
	0	
Lamina Dies & Tools, Inc141		
Landis Machine Company		
Lees-Bradner Company347	Oliver Instrument Company	31
Levin & Son, Louis	Oliver Machinery Company O'Neil-Irwin Manufacturing Company	302
Lincoln Electric Company, T. H315	O Neir-itwin Manufacturing Company	102
Lincoln Electric Company 101 Lincoln Park Industries, Inc. 44 Linley Brothers Company 319		
Linley Brothers Company		
Logan Engineering Company 72		
Lucifer Furnaces, Inc300		
Luma Electric Equipment Company296		
Madison-Kipp Corporation 282 Magnaflux Corporation 232 Mail Tool Company 306 Manhattam Rubber Division 196 (Raybestos Manhattam, Inc.) Martin Machine Company, J. E. 334 Marvel Tool & Machine Company 277	Pedrick Tool and Machine Company Perkins Machine Company Plunket Machine Company, J. E. Pope Machinery Corporation Portland Machine Tool Works, Inc. Prebco Bushing Company Precise Products Corp. Procunier Safety Chuck Company Prutton Corporation	134 333 51 56 334 241 106
MBI Export & Import, Ltd		
Melin Tool Company	R	
Midwest Tool & Engineering Company297	N.	
Millers Falls Company		
Modern Tool Works18-19	Raybestos Manhattan, Inc.	196
Mohawk Tools, Inc 47	(Manhattan Rubber Division)	
Morris Machine Tool Company54-55 Morse Twist Drill & Machine Company24-25	Reading Machine Company	333
Motch & Merryweather Machinery Co 50	Ready Tool Company	309
Mummert-Dixon Company290	Reid Brothers' Company, Incorporated	
	Reliant Gage & Supply Company Richards Company, J. A	234
	Richards Company, J. A. Ring Punch & Die Company	290
	Rivett Lathe & Grinder, Inc.	34
	Robbins Company, Omer E.	117
N	Rockford Clutch Division	86
	Rockwin Manufacturing CompanyRoll Feeds Corporation	
National Acme Company216	Ross Operating Valve Company	139
Neill & Company Ltd., James265	Rotor Tool Company	115



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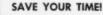
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JF	3/4	1/2	4.60
L1	1	1/2	7.00
PK	11/2	3/4	13.65
SM	2	1	20.50

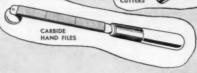


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60 to 65 horse power registered by horse power meter during the maximum cuts.

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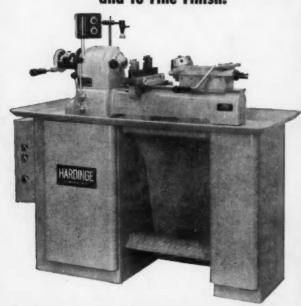
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